

San Luis Obispo County
Multi-Jurisdictional Hazard Mitigation Plan
2019 Update
October 2019



wood.

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Acknowledgements

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SECTION 1 ADOPTION RESOLUTIONS

The following is a record of adoption of this plan by San Luis Obispo County since its inception in 2005. Jurisdictional adoption resolutions can be referenced in Appendix D.

1.1 County of San Luis Obispo Board of Supervisors 2005 Adoption

Adoption by Local Governing Body: §201.6(c)(5)

November 1, 2005

To the Citizens, Visitors, Employees, and Officials of San Luis Obispo County:

As the costs of damage from natural disasters continue to increase, the County of San Luis Obispo realizes the importance of identifying effective ways to reduce vulnerability to disasters. Natural hazard mitigation plans assist communities in reducing risk from natural hazards by identifying resources, information, and strategies for risk reduction, while helping to guide and coordinate mitigation activities.

As a result the County of San Luis Obispo has developed this Local Hazard Mitigation Plan (LHMP) which provides guidance on how to reduce risk from natural hazards. This LHMP works in conjunction with other County plans, including the General Plan, and hazard mitigation plans developed for specific programs such as flood control and fire prevention.

This letter promulgates the San Luis Obispo County Local Hazard Mitigation Plan and constitutes the adoption of the Plan. This Local Hazard Mitigation Plan becomes effective on approval by the San Luis Obispo County Board of Supervisors on the date indicated below.

Original signed by Shirley Bianchi

Chairperson, Board of Supervisors
County of San Luis Obispo

November 1, 2005



1.2 County of San Luis Obispo Board of Supervisors 2011 Adoption

Adoption by Local Governing Body: §201.6(c)(5)

August 16, 2011

To the Citizens, Visitors, Employees, and Officials of San Luis Obispo County:

As the costs of damage from natural disasters continue to increase, the County of San Luis Obispo continues to realize the importance of identifying effective ways to reduce vulnerability to disasters. Natural hazard mitigation plans assist communities in reducing risk from natural hazards by identifying resources, information, and strategies for risk reduction, while helping to guide and coordinate mitigation activities.

As a result the County of San Luis Obispo has developed this updated and revised Local Hazard Mitigation Plan (LHMP) which provides guidance on how to reduce risk from natural hazards.

The LHMP works in conjunction with other County plans, including the General Plan, and hazard mitigation plans developed for specific programs such as flood control and fire prevention.

This letter promulgates the San Luis Obispo County Local Hazard Mitigation Plan and constitutes the adoption of the Plan. This Local Hazard Mitigation Plan becomes effective on approval by the San Luis Obispo County Board of Supervisors on the date indicated below.

Original signed by Adam Hill

Chairperson, Board of Supervisors
County of San Luis Obispo

August 16, 2011



1.3 San Luis Obispo County Flood Control and Water Conservation District 2013 Adoption

Adoption by Local Governing Body: §201.6 (c)(5)

December 10, 2013

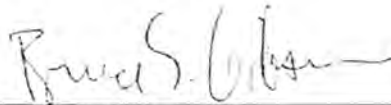
To the Citizens, Visitors, Employees, and Officials of San Luis Obispo County:

As the costs of damage from natural disasters continue to increase, the County of San Luis Obispo continues to realize the importance of identifying effective ways to reduce vulnerability to disasters. Natural hazard mitigation plans assist communities in reducing risk from natural hazards by identifying resources, information, and strategies for risk reduction, while helping to guide and coordinate mitigation activities.

As a result, the County of San Luis Obispo has developed this updated and revised Local Hazard Mitigation Plan (LHMP) which provides guidance on how to reduce risk from natural hazards.

The LHMP works in conjunction with the other County plans, including the General Plan, and hazard mitigation plans developed for specific programs such as flood control and fire prevention.

This letter promulgates the San Luis Obispo County Local Hazard Mitigation Plan and constitutes the adoption of the Plan. This Local Hazard Mitigation Plan becomes effective on approval by the San Luis Obispo County Flood Control and Water Conservation District on the date indicated below.



Bruce Gibson
Acting Chairperson, Board of Supervisors
San Luis Obispo County Flood Control
And Water Conservation District

December 10, 2013

1.4 County of San Luis Obispo Board of Supervisors 2013 Adoption

Adoption by Local Governing Body: §201.6 (c)(5)

December 10, 2013

To the Citizens, Visitors, Employees, and Officials of San Luis Obispo County:

As the costs of damage from natural disasters continue to increase, the County of San Luis Obispo continues to realize the importance of identifying effective ways to reduce vulnerability to disasters. Natural hazard mitigation plans assist communities in reducing risk from natural hazards by identifying resources, information, and strategies for risk reduction, while helping to guide and coordinate mitigation activities.

As a result, the County of San Luis Obispo has developed this updated and revised Local Hazard Mitigation Plan (LHMP) which provides guidance on how to reduce risk from natural hazards.

The LHMP works in conjunction with the other County plans, including the General Plan, and hazard mitigation plans developed for specific programs such as flood control and fire prevention.

This letter promulgates the San Luis Obispo County Local Hazard Mitigation Plan and constitutes the adoption of the Plan. This Local Hazard Mitigation Plan becomes effective on approval by the San Luis Obispo County Board of Supervisors on the date indicated below.



Bruce Gibson
Acting Chairperson, Board of Supervisors

December 10, 2013

1.5 County of San Luis Obispo Board of Supervisors 2019-2020 Plan Adoption Resolution

Placeholder for adoption resolution

SECTION 2 EXECUTIVE SUMMARY

2.1 Plan Description

The mounting cost of disaster recovery in the nation and State of California over the past decades has prompted a renewed interest in proactively determining effective ways to minimize hazard vulnerability. Hazard mitigation planning plays an important role in building resilience through identifying vulnerabilities and potential solutions in mitigation actions. The County of San Luis Obispo, its municipalities and its special districts have to develop this local hazard mitigation plan, which underwent a comprehensive update in 2019. The goal of this plan is to arrive at practical, meaningful, attainable and cost-effective mitigation solutions to reduce vulnerability to the identified hazards and ultimately reduce both human and financial losses from hazard events.

The following jurisdictions participated in the development of this plan:

Lead Jurisdiction:

- County of San Luis Obispo

Municipalities:

- City of Arroyo Grande
- City of Atascadero
- City of Grover Beach
- City of Morro Bay
- City of Paso Robles
- City of Pismo Beach
- City of San Luis Obispo

Community Services Districts:

- Avila Beach CSD
- Ground Squirrel Hollow CSD
- Heritage Ranch CSD
- Los Osos CSD
- Nipomo CSD
- Oceano CSD
- San Miguel CSD
- San Simeon CSD
- Templeton CSD

Special Districts:

- San Luis Obispo County Flood Control and Water Conservation District
- Cayucos Sanitary District
- Port San Luis Harbor District
- South San Luis Obispo County Sanitation District

Development of this mitigation plan included assessing mitigation capabilities, securing political support, and soliciting input and approval from each of the involved communities.

Risk assessments were performed that identified and evaluated priority natural and human-caused hazards that could impact the County and its jurisdictions. Historical hazard events are described. The future probability of these identified hazards and their impact on communities within the County is described.

Vulnerability assessments summarize the identified hazards' impact to critical structures, infrastructure, and future development. Estimates of potential dollar losses to vulnerable structures are presented.

The risk and vulnerability assessments were used to determine mitigation goals and objectives to minimize long-term vulnerabilities to the identified hazards. These goals and objectives were the foundation behind the development of a comprehensive range of specific attainable mitigation actions.

This plan was originally developed in 2005, updated in 2011 and 2013, and underwent a comprehensive update in 2019. A significant change to the plan in 2019 was the inclusion of the municipalities and special districts, broadening it from a County-specific plan to a multi-jurisdictional document prepared in coordination with the participating entities and input from the public. This plan entails adopting, implementing, assigning responsibility, monitoring, and reviewing this hazard mitigation plan over time, to ensure the goals and objectives are being achieved and the plan remains a relevant document.

2.2 Plan Purpose and Authority

The Disaster Mitigation Act (DMA) of 2000, also commonly known as "The 2000 Stafford Act Amendments" (the Act), constitutes an effort by the Federal government to reduce the rising cost of disasters. The Act stresses the importance of mitigation planning and disaster preparedness prior to an event.

Section 322 of the DMA requires local governments to develop and submit mitigation plans in order to qualify for the Federal Emergency Management Agency's (FEMA) Hazard Mitigation Assistance (HMA) grant program funds. For disasters declared after November 1, 2004, San Luis Obispo County must have a Local Hazard Mitigation Plan (LHMP) approved pursuant to §201.6 in order to receive HMA funding. The LHMP is written to meet the statutory requirements of DMA 2000 (P.L. 106-390), enacted October 30, 2000 and 44 CFR Part 201 – Mitigation Planning, Interim Final Rule, published February 26, 2002. The HMA grants include the Hazard Mitigation Grant Program (HMGP), Pre-Disaster Mitigation (PDM) program, and the Flood Mitigation Assistance (FMA) program. Additional FEMA mitigation funds include the HMGP Post Fire funding associated with Fire Management Assistance Grant (FMAG) declarations, the Building Resilient Infrastructure and Communities (BRIC) funding associated with the 2018 Disaster Recovery Reform Act (DRRA), and the Rehabilitation of High Hazard Potential Dams (HHPD) Grant Program.

To facilitate implementation of the DMA 2000, the Federal Emergency Management Agency (FEMA) created an Interim Final Rule (the Rule), published in the Federal Register in February of 2002 at section 201 of 44 CFR. The Rule spells out the mitigation planning criteria for States and local communities. Specific requirements for local mitigation planning efforts are outlined in section §201.6 of the Rule. In March 2013 FEMA released The Local Mitigation Planning Handbook (Handbook) as the official guide for local governments to develop, update and implement local mitigation plans. The Handbook complements and references the October 2011, FEMA Local Mitigation Plan Review Guide (Guide) in order to help "Federal and State officials assess Local Mitigation Plans in a fair and consistent manner." Local jurisdictions must demonstrate that proposed mitigation actions are based upon a sound planning



process that accounts for the inherent risk and capabilities of the individual communities as stated in section §201.5 of the Rule. Throughout the 2019 update of this LHMP the Handbook and Guide was consulted for the purpose of ensuring thoroughness, diligence, and compliance with the DMA 2000 planning requirements.

The 2019 update occurred concurrent with the update of the County General Plan Safety Element update to ensure consistency with hazards and mutually reinforcing policies. In addition to following the DMA requirements the update addressed the following State of California legislation requirements that relate to the General Plan and LHMP:

- Senate Bill (SB) 379: Requires inclusion of climate adaptation strategies in General Plan Safety Elements and encourages inclusion of climate change discussion in LHMP updates;
- SB 1000 requires environmental justice and social equity considerations in the General Plan update; these considerations were also addressed in the inclusion of social vulnerability and related discussion in Section 4 San Luis Obispo County Profile and mitigation action prioritization criteria detailed in Section 7.
- Assembly Bill (AB) 2140 which recommends adoption by reference or incorporation of the LHMP into the Safety Element of the General Plan, following LHMP approval.

This Local Hazard Mitigation Plan was prepared jointly by the County of San Luis Obispo; the Cities of Arroyo Grande, Atascadero, Grover Beach, Morro Bay, Paso Robles, Pismo Beach, and San Luis Obispo; the Community Services Districts of Avila Beach, Ground Squirrel Hollow, Heritage Ranch, Los Osos, Nipomo, Oceano, San Miguel, San Simeon, and Templeton; and special districts including the San Luis Obispo County Flood Control and Water Conservation District, the Cayucos Sanitary District, the Port San Luis Harbor District, and the South San Luis Obispo County Sanitation District. The risk assessment and mitigation strategies within this plan were developed jointly to benefit all of the above jurisdictions and make them more resilient to future disasters.



SECTION 3 PLANNING PROCESS

DMA Requirements §201.6(b) and §201.6(c)(1):

An open public involvement process is essential to the development of an effective plan. In order to develop a more comprehensive approach to reducing the effects of natural disasters, the planning process shall include:

- (1) An opportunity for the public to comment on the plan during the drafting stage and prior to plan approval;*
- (2) An opportunity for neighboring communities, local and regional agencies involved in hazard mitigation activities, and agencies that have the authority to regulate development, as well as businesses, academia, and other private and non-profit interests to be involved in the planning process; and*
- (3) Review and incorporation, if appropriate, of existing plans, studies, reports, and technical information.*

[The plan shall document] the planning process used to develop the plan, including how it was prepared, who was involved in the process, and how the public was involved.

3.1 Background on Mitigation Planning in San Luis Obispo County

The primary purpose of the San Luis Obispo County Multi-Jurisdictional Hazard Mitigation Plan (LHMP) update is to reduce or eliminate long-term risk to people and property from natural hazards and their effects on the San Luis Obispo County planning area. San Luis Obispo County recognized the need and importance of a Local Hazard Mitigation Plan (LHMP) and initiated its development in 2005 after receiving a grant from the Federal Emergency Management Agency (FEMA), which also served as the primary funding source for this plan. The original LHMP was developed in 2005, updated in 2011, and most recently in 2013 with final approval from FEMA in 2014. Additional details on the previous planning effort can be referenced in the 2014 Plan.

The plan underwent a comprehensive update in 2019. The planning process followed during the update was similar to what was used in the original plan development. This planning process utilized the input from a multi-jurisdictional Hazard Mitigation Planning Committee (HMPC). A significant change from the 2014 Plan is the inclusion of all of the incorporated communities within the planning area (seven), nine community service districts, and four special districts. Wood Environment & Infrastructure Solutions, Inc (Wood) was procured to assist with the update in 2019. The process is described further in this section and documented in Appendix C.

3.2 What's New in the Plan Update

DMA Requirement §201.6(d)(3):

A local jurisdiction must review and revise its plan to reflect changes in development, progress in local mitigation efforts, and changes in priorities, and resubmit it for approval within 5 years in order to continue to be eligible for mitigation project grant funding.

The updated LHMP complies with Federal Emergency Management Agency (FEMA) guidance and California Office of Emergency Services guidelines for Local Hazard Mitigation Plans. The update followed the requirements noted in the Disaster Mitigation Act (DMA) of 2000 and FEMA's 2013 Local Hazard Mitigation Planning Handbook.



This LHMP update involved a comprehensive review and update of each section of the 2014 plan and includes an assessment of the progress in evaluating, monitoring and implementing the mitigation strategy outlined in the initial plan. The planning process provided an opportunity to review jurisdictional priorities related to hazard significance and mitigation action, and revisions were made where applicable to the plan and the municipal annexes. Another major change in priority was the desire to expand the LHMP into a multi-jurisdictional plan (see subsection 3.2.1). Only the information and data still valid from the 2014 plan was carried forward as applicable into this LHMP update.

3.2.1 Changes in Jurisdictional Participation

A significant change to the 2019 Plan is that it is now a multi-jurisdictional HMP. Previously in the 2014 Plan, the only additional jurisdiction covered by the LHMP was the San Luis Obispo County Flood Control and Water Conservation District (FCWCD). The FCWCD continued to participate in the 2019 planning process, in addition to four (4) other special districts, nine (9) community service districts (CSD) and participation from all seven (7) incorporated municipalities in the County. The municipalities previously had been covered by separate LHMPs. All of the municipalities previously had local hazard mitigation plans, which were used as the basis to inform and update jurisdictional annexes. As such, this Plan constitutes an LHMP update for those jurisdictions and also for the County, County FCWCD, Los Osos CSD and the South San Luis Obispo County Sanitation District, which were also covered by previous LHMPs. One Community Service District (CSD), Oceano, had recently completed and submitted its LHMP to FEMA for approval in 2019; this plan was approved by FEMA in 2019 as a single jurisdictional plan. The LHMP is included in its entirety as an annex for easy reference and coordination on mitigation activities, and to be considered for inclusion as part of the next five year update of the County multi-jurisdictional HMP. The Cambria CSD and Cambria Healthcare District have a FEMA-approved LHMP (February 2018) and are not covered in this plan. This Plan constitutes a new LHMP for the following jurisdictions:

Community Service Districts:

- Avila Beach CSD
- Ground Squirrel Hollow CSD
- Heritage Ranch CSD
- Nipomo CSD
- San Miguel CSD
- San Simeon CSD
- Templeton CSD

Special Districts:

- Cayucos Sanitary District
- Port San Luis Harbor District

3.2.2 Plan Section Review and Analysis - 2019 Update

During the 2019 plan update, the HMPC updated each of the sections of the previously approved plan to include new information. Wood developed a summary of each section in the plan and guided the HMPC through the elements that needed updating during the kickoff meeting in January 2019. This included analyzing each section using FEMA's local plan update guidance (2013) to ensure that the plan met the latest requirements. In addition, the FEMA Local Mitigation Plan Review Tool that was provided with the



approval of the 2014 version of this plan was reference, in particular the 2014 FEMA comments on opportunities for improvement were considered and addressed in the 2019 update. The HMPC and Wood determined that nearly every section of the plan would need revision to align the plan with the latest FEMA planning guidance and requirements. A summary of the changes in this plan update is highlighted in the table below.

Table 3-1 San Luis Obispo County Hazard Mitigation Plan Update Highlights

Plan Section	Summary of Plan Review, Analysis, and Updates
1. Promulgation and Adoption	Includes history of previous adoptions Plan will be re-adopted as part of the update process
2. Introduction and Executive Summary	Revised to reflect updated plan and 2019 planning process
3. Planning Process	Describes and documents the planning process for the 2019 update, including coordination among agencies Describes how 2014 plan was integrated with/into other planning efforts. Removed 2014 planning process info. Describes changes to jurisdictional participation Describes 2019 public participation process Describes the Hazard Mitigation Planning Committee Describes the 10 step process followed for the update
4. County Profile	Updated with recent census data and current economy description Updated land use and development trends
5. Hazard Assessment	Drought and Coastal Storm are now profiled as separate hazards and are no longer part of Adverse Weather Extreme heat has been added as a hazard under Adverse Weather Marine invasive species has been added to Agricultural pest infestation and plant disease Vector borne disease has been added to Biological Agents Discussion on levee failure has been added to Flood Debris Flow has been added to Landslides Coastal storms and sea level rise have been added to Coastal Erosion Subsidence was added as a standalone hazard profile Climate change information has been added to each hazard profile Updated list of disaster declarations to include recent data. Updated tables to include recent National Center for Environmental Information data. Updated past occurrences for each hazard to include recent data.
5. Risk Assessment	2014 Plan on Vulnerability Assessment is now included with the Risk Assessment section as subsections by hazard. Updated critical facilities identified from the 2014 plan. Updated growth and development trends to include recent Census and local data sources. Updated historic and cultural resources using local/state/national sources. Updated property values for vulnerability and exposure analysis, using updated building information based on assessor's data. Updated estimate flood losses using the latest Digital Flood Insurance Rate Map (DFIRM) and assessor's data.



Plan Section	Summary of Plan Review, Analysis, and Updates																
	<p>Updated National Flood Insurance Program (NFIP) data and Repetitive Loss structure data from the previous plan.</p> <p>Incorporated new hazard loss estimates since 2014, as applicable.</p> <p>Used updated GIS inventory data to assess wildfire threat to the County</p> <p>Updated HAZUS-MH Level I earthquake vulnerability analysis data</p> <p>Updated information regarding specific vulnerabilities to hazards, including maps and tables of specific assets at risk, specific critical facilities at risk, and specific populations at risk.</p> <p>Updated maps in plan where appropriate.</p>																
6. Capability Assessment	<p>Reviewed mitigation capabilities and update to reflect current capabilities.</p> <p>Added capability summary tables for regulatory, administrative/technical, and fiscal mitigation capabilities.</p> <p>Added capabilities for new hazards profiled in Section 5.</p> <p>Added information on how capabilities could be expanded or enhanced.</p>																
7. Mitigation Strategy	<p>Indicated what actions have been implemented that may reduce previously identified vulnerabilities.</p> <p>Updated mitigation strategy based on the results of the updated risk assessment, completed mitigation actions, and implementation obstacles and opportunities since the completion of the 2014 plan.</p> <p>Reviewed and updated goals and objectives based on HMPC input.</p> <p>Included updated information on how actions are prioritized, or how priorities changed.</p> <p>Reviewed mitigation actions from the 2014 plan and developed a status report for each; identified if actions have been completed, deleted, or deferred/carried forward. Updated priorities on actions.</p> <p>Identify examples of successful implementation to highlight positive movement on actions identified in 2014 plan.</p> <p>Identified new mitigation actions proposed by the HMPC with more detail on implementation than the previous plan.</p> <p>Developed a summary table of mitigation actions for all participating jurisdictions.</p>																
8. Implementation and Monitoring	<p>Reviewed and updated procedures for monitoring, evaluating, and updating the plan.</p> <p>Revised to reflect current methods.</p> <p>Updated the system for monitoring progress of mitigation activities by identifying additional criteria for plan monitoring and maintenance.</p> <p>Added a process for incorporation of the HMP into existing mechanisms</p>																
Jurisdictional Annexes	<p>Developed annexes for new participating jurisdictions in 2019.</p> <p>Moved previous information in 2014 plan on San Luis Obispo County Flood Control and Water Conservation District into jurisdictional annex</p> <table data-bbox="462 1598 808 1877"> <tr><td>A</td><td>City of Arroyo Grande</td></tr> <tr><td>B</td><td>City of Atascadero</td></tr> <tr><td>C</td><td>City of Grover Beach</td></tr> <tr><td>D</td><td>City of Morro Bay</td></tr> <tr><td>E</td><td>City of Paso Robles</td></tr> <tr><td>F</td><td>City of Pismo Beach</td></tr> <tr><td>G</td><td>City of San Luis Obispo</td></tr> <tr><td>H</td><td>Avila Beach CSD</td></tr> </table>	A	City of Arroyo Grande	B	City of Atascadero	C	City of Grover Beach	D	City of Morro Bay	E	City of Paso Robles	F	City of Pismo Beach	G	City of San Luis Obispo	H	Avila Beach CSD
A	City of Arroyo Grande																
B	City of Atascadero																
C	City of Grover Beach																
D	City of Morro Bay																
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F	City of Pismo Beach																
G	City of San Luis Obispo																
H	Avila Beach CSD																



Plan Section	Summary of Plan Review, Analysis, and Updates
	<p>I Ground Squirrel Hollow CSD</p> <p>J Heritage Ranch CSD</p> <p>K Los Osos CSD</p> <p>L Nipomo CSD</p> <p>M Oceano CSD</p> <p>N San Miguel CSD</p> <p>O San Simeon CSD</p> <p>P Templeton CSD</p> <p>Q SD - Cayucos Sanitary District</p> <p>R SD - Port San Luis Harbor District</p> <p>S SD - San Luis Obispo FCWCD</p> <p>T SD - South San Luis Obispo County Sanitation District</p>
Appendices	<p>Appendix A: Hazard Mitigation Planning Committee</p> <p>Appendix B: Mitigation Categories, Alternatives, and Selection Criteria</p> <p>Appendix C: Planning Process Documentation</p> <p>Appendix D: Jurisdiction Adoption Resolutions</p> <p>Appendix E: Critical Facilities</p> <p>Appendix F: Climate Change Adaptation Planning Guide Consistency Summary</p> <p>Appendix G: Climate Change Adaptation and Resilience Statutory Consistency Summary</p> <p>Appendix H: References</p>

3.3 Local Government Participation

In the 2019 plan update, the following jurisdictions participated in the planning process and will be adopting the updated plan following FEMA approval. As noted previously, all participants are new to the SLO County LHMP except for San Luis Obispo Flood Control and Water Conservation District which participated in the 2014 planning process. All incorporated cities in the County participated in this planning process as well as four (4) special districts, nine (9) community service districts (CSD). The County and the municipalities have the authority to regulate development within their jurisdictions; the County has authority for regulating development within the unincorporated areas including the CSDs.

Lead Jurisdiction:

- County of San Luis Obispo

Municipalities:

- City of Arroyo Grande
- City of Atascadero
- City of Grover Beach
- City of Morro Bay
- City of Paso Robles
- City of Pismo Beach
- City of San Luis Obispo

Community Service Districts:

- Avila Beach CSD



- Ground Squirrel Hollow CSD
- Heritage Ranch CSD
- Los Osos CSD
- Nipomo CSD
- San Miguel CSD
- San Simeon CSD
- Templeton CSD

Special Districts:

- San Luis Obispo County Flood Control and Water Conservation District
- Cayucos Sanitary District
- Port San Luis Harbor District
- South San Luis Obispo County Sanitation District

The DMA planning regulations and guidance stress that each local government seeking FEMA approval of their mitigation plan must participate in the planning effort in the following ways:

- Participate in the process as part of the HMPC
- Detail areas within the planning area where the risk differs from that facing the entire area
- Identify potential mitigation actions
- Formally adopt the plan

For the San Luis Obispo County planning area's HMPC, "participation" meant the following:

- Providing facilities for meetings
- Attending and participating in the HMPC meetings
- Completing and returning Wood Plan Update Guide worksheets
- Collecting and providing other requested data (as available)
- Identifying mitigation actions for the plan
- Reviewing and providing comments on plan drafts and jurisdictional annexes
- Informing the public, local officials, and other interested parties about the planning process and providing opportunity for them to comment on the plan
- Coordinating, and participating in the public input process
- Coordinating the formal adoption of the plan by the governing boards

The County and all jurisdictions with annexes to this plan and seeking FEMA approval met all of these participation requirements. In most cases one or more representatives for each jurisdiction attended the multi-jurisdictional meetings described in Table 3.2 Schedule of Planning Meetings and brought together a local planning team to help collect data, identify mitigation actions and implementation strategies, and review and provide data on annex drafts. In some cases, the jurisdictions had limited capacity to attend or had conflicts with HMPC meetings; in these cases, alternative forms of communication were used to provide input into the process. Appendix C provides additional information and documentation of the planning process.

3.4 Planning Process

Wood established the planning process for the San Luis Obispo County Multi-Jurisdictional Hazard Mitigation Plan using the DMA planning requirements and FEMA's associated guidance. The original FEMA planning guidance is structured around a four-phase process:

1. Organize Resources
2. Assess Risks
3. Develop the Mitigation Plan
4. Implement the Plan and Monitor Progress

Into this process, Wood integrated a more detailed 10-step planning process used for FEMA's Community Rating System (CRS) and Flood Mitigation Assistance programs. Thus, the modified 10-step process used for this plan meets the requirements of major grant programs including: FEMA's Hazard Mitigation Grant Program, Pre-Disaster Mitigation program, Flood Mitigation Assistance Program, and flood control projects authorized by the U.S. Army Corps of Engineers.

In 2013, FEMA released the Local Mitigation Planning Handbook that has become the official guide for local governments to develop, update and implement local mitigation plans. While the requirements under §201.6 have not changed, the Handbook provides guidance to local governments on developing or updating hazard mitigation plans to meet the requirements under the Code of Federal Regulations (CFR) Title 44 – Emergency Management and Assistance §201.6, Local Mitigation Plans for FEMA approval and eligibility to apply for FEMA Hazard Mitigation Assistance grant programs. It also offers practical approaches, tools, worksheets and local mitigation planning examples for how communities can engage in effective planning to reduce long-term risk from natural hazards and disasters. The Handbook complements and liberally references the Local Mitigation Plan Review Guide (October 1, 2011), which is the official guidance for Federal and State officials responsible for reviewing local mitigation plans in a fair and consistent manner.

Table 3-2 shows how the modified 10-step process fits into FEMA's four-phase process, and how these elements correspond to the tasks in the FEMA Mitigation Planning Handbook.

Table 3-2 San Luis Obispo County Hazard Mitigation Planning Process

San Luis Obispo County Hazard Mitigation Planning Process		
FEMA's 4-Phase DMA Process	Modified 10-Step CRS Process	FEMA Local Mitigation Planning Handbook Tasks
1) Organize Resources		
201.6(c)(1)	1) Organize the Planning Effort	1: Determine the planning area and resources
201.6(b)(1)	2) Involve the Public	2: Build the planning team - 44 CFR 201.6 (C)(1)
201.6(b)(2) and (3)	3) Coordinate with Other Departments and Agencies	3: Create an outreach strategy - 44 CFR 201.6(b)(1)
		4: Review community capabilities - 44 CFR 201.6 (b)(2)&(3)
2) Assess Risks		
201.6(c)(2)(i)	4) Identify the Hazards	



FEMA’s 4-Phase DMA Process	Modified 10-Step CRS Process	FEMA Local Mitigation Planning Handbook Tasks
201.6(c)(2)(ii)	5) Assess the Risks	5: Conduct a risk assessment - 44 CFR 201.6 (C)(2)(i) 44 CFR 201.6(C)(2)(ii)&(iii)
3) Develop the Mitigation Plan		
201.6(c)(3)(i)	6) Set Goals	6: Develop a mitigation strategy - 44 CFR 201.6(c)(3)(i); 44 CFR 201(c)(3)(ii) and 44 CFR 201.6(c)(3)(iii)
201.6(c)(3)(ii)	7) Review Possible Activities	
201.6(c)(3)(iii)	8) Draft an Action Plan	
4) Implement the Plan and Monitor Progress		
201.6(c)(5)	9) Adopt the Plan	7: Review and adopt the plan
201.6(c)(4)	10) Implement, Evaluate, and Revise the Plan	8: Keep the plan current
		9: Create a safe and resilient community - 44 CFR 201.6(c)(4)

3.4.1 Phase 1: Organize Resources

Planning Step 1: Organize the Planning Effort

The 2019 planning process and update of the LHMP had its roots in the development of a grant application. The County Office of Emergency Services (OES) wrote the grant and in the process solicited commitments from local government jurisdictions that were interested in participating. With an understanding of the number of jurisdictions and their commitment to participate, the grant application was approved and awarded to the County in 2018. A request for proposals was utilized to bring on a qualified planning consultant. The update process was formally initiated in January 2019 under the coordination of the County of San Luis Obispo Planning & Building Department as the lead entity, in coordination with OES, so that the effort could be coordinated with a parallel effort to update the General Plan Safety Element. Wood worked with the Planning & Building staff and OES to establish the framework and organization for development of the plan. Wood assisted County staff with coordination with other governmental agencies and public process elements to develop the updated LHMP for San Luis Obispo County. Organizational efforts were initiated with a series emails to inform and educate jurisdictions within the County of the purpose and need for an update to the countywide hazard mitigation plan. Representatives from participating jurisdictions and HMPC members from the 2014 plan were used as a starting point for the invite list, with additional invitations extended as appropriate throughout the planning process. The HMPC was re-established as a result of this effort. Membership of the HMPC is detailed in Appendix A.

Planning Meetings

The planning process officially began with a kickoff meeting on January 25, 2019. The meeting covered the scope of work and an introduction to the DMA requirements. Participants were provided with a Local Hazard Mitigation Plan Update Workbook, which included worksheets to facilitate the collection of information necessary to support update of the plan. Using FEMA guidance, Wood designed these worksheets to capture information on past hazard events, identify hazards of concern to each of the participating jurisdictions, quantify values at risk to identified hazards, inventory existing capabilities, and



record possible mitigation actions. A copy of Wood’s Local Hazard Mitigation Plan Update Guide for this project is included in Appendix C. The County and each jurisdiction seeking FEMA approval of their plan completed and returned the worksheets in either the Local Hazard Mitigation Plan Update Workbook or shared their most recent local hazard mitigation plan for incorporation into the plan document.

During the planning process, the HMPC communicated through face-to-face meetings, email, and telephone conversations. Draft documents were posted on a Google Drive and in some cases emailed so that the HMPC members could easily access and review them. The HMPC formally met four times during the planning period (January 25, 2019 – April 30, 2019). The purposes of these meetings are described in Table 3.2. The planning consultant sent meeting handouts ahead of time to the participating jurisdictions to review and provide feedback before or at the meeting. In addition to these meetings some jurisdictions held meetings with subcommittees to discuss the needed input for the plan update. In a couple cases some municipalities were not able to attend the planning workshops due to scheduling conflicts or limited staff capacity. A planner in the County Planning & Building Department – Long Range Division and the planning consultant worked with the jurisdictions individually in those cases to obtain necessary information and input into the planning process. This was done through direct emails from the planning consultant and follow-up phone conversations with the consultant and the County Planner where necessary.

Table 3-3 Schedule of Planning Meetings

Meeting Type	Meeting Topic	Meeting Date(s)	Meeting Location(s)
HMPC #1	Kick-off meeting: introduction to DMA, the planning process, planning for public involvement and hazard identification	January 25, 2019	San Luis Obispo
HMPC #2	Hazard Identification and Risk Assessment results, capability assessment updates	March 19, 2019	San Luis Obispo
HMPC #3	Update of mitigation goals and objectives, capabilities, previous mitigation action progress	April 25, 2019	San Luis Obispo
HMPC #4	Development and prioritization of mitigation action recommendations	April 30, 2019	San Luis Obispo

HMPC Meeting #1 -Kickoff Meeting

On January 25, 2019, the Planning Team convened in person to discuss the process for completing the update of this plan. The kickoff meeting was well attended with thirty-three (33) individuals present. The audience was a mix of county departments, local governments, special districts and stakeholders. Representatives from the County department included: Planning & Building, Office of Emergency Services, Public Works and the Agricultural Department. All participating municipalities and Community Service Districts had representatives present at the meeting. Stakeholders present at the meeting included representatives from the San Luis Obispo County Fire Safe Council, and a Professor of City and Regional Planning from Cal Poly, San Luis Obispo. A complete list of those in attendance at the kickoff meeting can be found in the sign-in sheets in Appendix C.

Following introductions, Wood reviewed the DMA requirements and the suggested planning process to follow to meet the requirements as well as the expected schedule of the process. The roles of the HMPC and stakeholder was discussed including the participation requirements for the different roles.



During the kickoff meeting the Planning Team validated the identified hazards within the 2014 plan with minor revisions and collaboratively prioritized the hazards for the purpose of identifying which are “of most concern” to the County. More details are included in Section 5 Risk Assessment.

The group also discussed other agencies that should be part of this planning process, as well as related planning efforts to be coordinated with and recent studies to be incorporated. Part of this discussion was also related to creating a public outreach strategy to involve the public throughout the planning process. Suggestions on public involvement tools included,

- Outreach through social media
- Posting information on local government websites
- Utilize City of San Luis Obispo’s City Hall web platform
- Create and disseminate an online public survey

The kickoff meeting ended with Wood sharing handouts to assist in the planning process. These handouts included the Local Hazard Mitigation Plan Update Workbook which outlined data collection needs for each participating jurisdiction.

HMPC Meeting #2 – Risk and Goals

On March 19, 2019, the HMPC convened in person to discuss the results of the risk and vulnerability assessment. Twenty-four (24) members of the HMPC were present for the discussion. Wood began the meeting with a presentation on the results the risk assessment for natural hazards, results for hazardous material incidents were presented at the next meeting. A handout summarizing the hazard significance for each jurisdiction was shared for Planning Team to review. The group went through each hazard together and discussed the results as well as shared any local insight to inform the HIRA update. Refer to the meeting summary in Appendix C for notes related to each hazard discussed. Part of this discussion was also related to development trends.

Following the discussion on the results of the risk assessment, the group was provided a handout that summarized current goals and objectives from the County HMP, jurisdictional HMPs and the State HMP. Wood explained this update process provides an opportunity to review the previous plan’s goals to determine if they are still valid, comprehensive, and reflect current priorities and updated risk assessment. The group was also encouraged to share their jurisdiction’s goal statements with their local planning teams prior to the next meeting to discuss if changes are necessary.

Wood shared with group that the online public survey had been opened and already received thirty (30) responses at that time. A link was shared with the HMPC to easily distribute by email and for posting on websites. The meeting ended with a review of the next steps and planning process schedule.

HMPC Meeting #3 – Goals, Capabilities, and Action Status

The HMPC reconvened on April 25, 2019 to discuss goal revisions and updates, updates to the capability assessment and status of mitigation actions from the previous County and jurisdictional HMPs. The meeting began with a status update of the planning process and a review of the additional vulnerability assessment data related to hazardous material incidents. This was followed by discussion on the revised goals, with some additional adjustments suggested by the group. The capability assessment update was also discussed; it was emphasized that each jurisdiction should consider options for enhancing or

expanding their mitigation capabilities. Progress on mitigation actions was also summarized in anticipation of developing new actions in a subsequent meeting.

HMPC Meeting #4 – Mitigation Action Workshop

On April 30th, 2019, the HMPC convened in person to identify new mitigation actions to include in the updated plan. This encompassed a review of possible mitigation activities, alternatives, and related climate adaptation strategies. The group also discussed criteria for mitigation action selection and prioritization. This was followed by a brainstorming session to elicit the development of new mitigation actions. Entities responsible for new mitigation action implementation were identified. A sticky dot exercise was used as an initial prioritization on the new mitigation actions. Mitigation action worksheets were distributed to allow additional details to be added following the workshop.

Planning Step 2: Involve the Public

Involving the public assures support from the community at large and is a required part of the planning process per the DMA 2000. Early discussions with the San Luis Obispo County planning staff and input received in the first HMPC meeting established the initial plan for public involvement in the plan update. Public outreach began with the creation of an online public survey that was shared with each participating jurisdiction to post on their websites and disseminate via email to local stakeholders. The public outreach activities described here were conducted with participation from and on behalf of all jurisdictions participating in this plan.

Throughout the planning process public workshops were held to inform the public of the purpose of the DMA and the hazard mitigation planning process for the San Luis Obispo County planning area. At each workshop the public in attendance were provided comment cards to leave any comments related to the County's Hazard Mitigation Plan as well as provide their contact information if they would like to receive ongoing updates and information related to the planning process.

At the kick-off meeting, the HMPC discussed additional options for public involvement and agreed to an approach using established public information mechanisms and resources within the community. Public involvement activities included press releases, website postings, flyer development and distribution, public meetings, and the collection of public comments on the draft plan. To promote the first workshop County staff reached out to local media outlets to inform the public of the opportunity to participate and posted on several community calendars. Posts were created on the following community calendars:

- KSBY
- KCBX
- KEYT/ KCOY
- New Times/Santa Maria Sun
- Paso Robles Daily News
- Santa Maria Times
- Tribune
- Cambrian News
- Pacific Coast Business Times

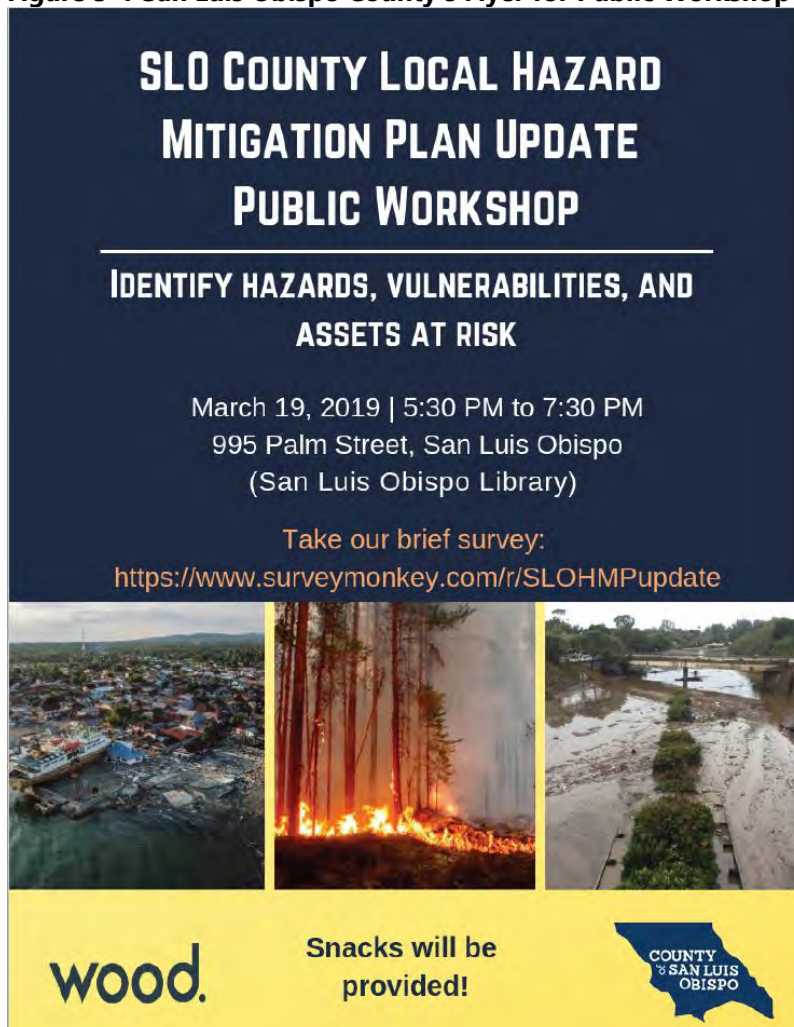
County-wide stakeholders were identified, and invites were also sent to:

- Cal Poly MCRP Professors

- Cambria CSD
- SLO Fire Safe Council
- California Department of Corrections and Rehabilitation - Associate Warden California Men's Colony (CMC)
- Department of State Hospitals
- Xolon Salinan Tribe
- Tenet Health
- SLO COG
- Coastal Commission
- Head of Safety Committee Cayucos
- Safety and Emergency Plans Templeton
- Paso Robles Joint Unified School District
- San Luis Coastal Unified School District
- Assistant Superintendent, Lucia Mar Schools

Figure 3-1 below is the flyer the County HMPC used to advertise the first public workshop on March 19, 2019. Press releases can be found in Appendix C.

Figure 3-1 San Luis Obispo County's Flyer for Public Workshop #1, March 19, 2019

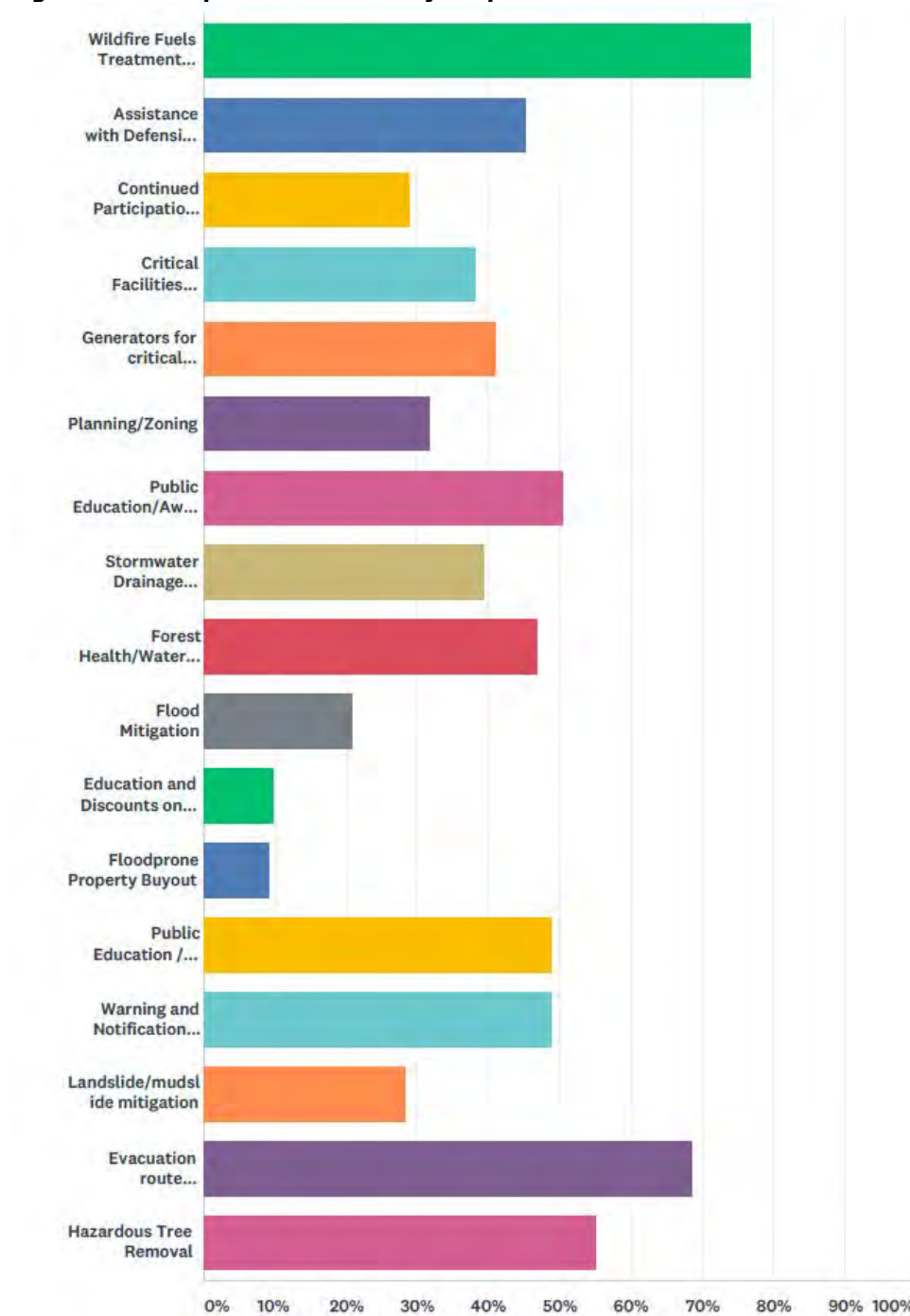


Online Public Survey

During the plan update's drafting stage, an online public survey was developed as a tool to gather public input. The survey was for the public to provide feedback to the San Luis Obispo County Multi-jurisdictional Hazard Mitigation Planning Committee on reducing hazard impacts. The survey provided an opportunity for public input during the planning process, prior to finalization of the plan update. The survey gathered public feedback on concerns about hazards and input on strategies to reduce their impacts. The survey was released in March and closed on May 14th. The HMPC provided links to the public survey by distributing it using social media, email, and posting the link on websites. The County provided laptops that could be used to fill out the survey at the first public meeting, as well as flyers with the survey link as handouts.



Figure 3-2 Example of Public Survey Response



Three hundred and twenty-two (322) people filled out the survey online. Results showed that the public perceives the most significant hazards to be wildfire, earthquake and drought and water shortage. Figure 3-1 above, shows the responses to question 3 of the survey, which solicited the public's opinion on the mitigation actions that should have the highest priority in the updated hazard mitigation plan. Wildfire fuels treatment projects, evacuation route development, hazardous tree removal, and public education and awareness of hazards were cited as the most popular mitigation actions. This information was shared

with the HMPC during the update of the mitigation strategy as a source of potential mitigation ideas. A summary of all the survey data and documentation of the public feedback can be found in Appendix C.

Public Workshops

Two public workshops were held during the planning process to inform the public, receive input to integrate into the plan update and keep the public updated on the progress being made in the planning process.

The first workshop was held on March 19, 2019 with fifteen (15) members of the public were present. The intent of the first was to introduce the public to the hazard mitigation planning process for the County's Plan Update as well as answer any questions and gather public input to be integrated into the plan update. In addition it was an opportunity to help staff identify risks, hazards and vulnerabilities from the public's perspective. The HMPC received three comment cards from meeting that helped to inform the Planning Team on the public initial thoughts on hazard mitigation and hazards in their community each can be found in Appendix C.

The second public workshop was held on April 30, 2019 and was well attended with thirteen members of the public, as well as stakeholders from Cal Poly and the County Farm Bureau. The primary intent of the second workshop was to gather feedback on mitigation strategies to reduce the identified hazard vulnerabilities, answer questions and collect input to share with the HMPC. This workshop was also an opportunity to inform the public on the Safety Element update of the County's General Plan and how that effort related to the County's Hazard Mitigation Plan. Two local news stations (KEYT and KSBY) were also present at the meeting and each reported on the planning process and shared the link to the online public survey in TV broadcast segments the following morning.

Example press releases and sign in sheets are located in Appendix C. Prior to finalizing the plan the draft was available online on the San Luis Obispo County website.

Table 3-4 Public Meeting Schedule

Meeting Topic	Meeting Date	Meeting Location
Introduce the Disaster Mitigation Act of 2000 and the hazard mitigation planning process for the County's plan update. Reviewed the results of the risk assessment and discussed mitigation action strategies.	March 19, 2019	San Luis Obispo Library, City of San Luis Obispo
Discuss and gather feedback on mitigation strategies to reduce identified hazard vulnerabilities, answer questions and collect input to share with the HMPC for the plan update. Shared the progress on the update to the General Plan Safety Element and how it relates to the HMP.	April 30, 2019	Ludwick Community Center, City of San Luis Obispo
Introduce public review draft of plan and solicit feedback.	October 14, 2019	November 15, 2019

Public Review Period

On October 14, 2019, a public review draft of this plan was released for comment and made available for download via the County Planning & Building Department website. Comments were collected through November 13, 2019. The draft plan was advertised through social media, mass emailing and an advertisement through the media mechanisms noted previously. An electronic comment form through

SurveyMonkey was provided with the draft plan. Two comments were received and are documented in Appendix C. One comment received related to providing evacuation routes and integrate evacuation planning into this plan. While detailed evacuation routes are outside the scope of this plan, the County does have a number of evacuation plans which are noted in subsection 6.1 that include hazard-specific plans for dam and levee failure, wildfire (West Atascadero, Parkhill, Avila, Cambria, Upper Los Berros, Suey Creek), tsunami, and Diablo Canyon radiological incidents. The former Director of the County's Office of Emergency Services also reviewed and provided input to the committee on portions of Section 4, Community Profile and Section 5 Hazard Identification and Risk Assessment; this resulted in edits in those sections to clarify correct or enhance the existing information where applicable.

Planning Step 3: Coordinate with Other Departments and Agencies

Early in the planning process, state and local agencies and organizations were invited to participate as stakeholders in the process. Stakeholders include local and regional agencies involved in hazard mitigation activities or those beyond the County and local government that have the authority to regulate development, including the California Coastal Commission and the Xolon Salinan Tribe. Stakeholders could participate in various ways, either by contributing input at HMPC meetings, being aware of planning activities through an email group, providing information to support the effort, or reviewing and commenting on the draft plan. Based on their involvement in other hazard mitigation planning efforts, and status in the County, representatives from the following agencies and organizations were invited to participate as stakeholders in the process; an asterisk indicates they participated in HMPC meetings:

- Cal Poly, San Luis Obispo*
- Cambria CSD
- Oceano CSD*
- SLO Fire Safe Council*
- Associate Warden CMC
- Department of State Hospitals*
- Xolon Salinan Tribe
- Tenet Health
- San Luis Obispo Council of Governments (SLOCOG)
- Coastal Commission
- Retired Cal Poly professor/citizen*

The majority of the listed stakeholders were invited to participate in the planning process, which included an invitation to attend the kickoff meeting. Several opportunities were provided for the above groups to participate in the planning process. At the beginning of the planning process, invitations were extended to these groups via an email from the Planning & Building staff project manager to actively participate on the HMPC. They were also invited via email to the public meetings discussed previously.

Coordination with key agencies, organizations, and advisory groups throughout the planning process allowed the HMPC to review common problems, development policies, and mitigation strategies as well as identifying any conflicts or inconsistencies with regional mitigation policies, plans, programs and regulations. Phone calls and emails were used during plan development to directly coordinate with key individuals representing other regional programs.

As noted by the asterisks next to the above names, many of these groups found it beneficial to participate on the HMPC or attend public meetings. Others assisted in the process by providing data directly as

requested in the Local Hazard Mitigation Plan Update Guide or through data contained on their websites. Further as part of the both HMPC and public outreach processes, all groups were invited to review and comment on the plan prior to submittal to Cal OES and FEMA.

As part of the public review and comment period for the draft plan, key agencies were again specifically solicited to provide any final input to the draft plan document. This input was solicited both through membership on the HMPC and by direct emails to key groups and associations to review and comment on the plan. As part of this targeted outreach, these key stakeholders were also specifically invited to attend the HMPC and public meeting to discuss any outstanding issues and to provide input on the draft document and final mitigation strategies.

In summary, several opportunities were provided for the groups listed above to participate in the planning process. At the beginning of the planning process, invitations were extended to these groups to actively participate on the HMPC. Specific participants from these groups are detailed in Appendix A. Others assisted in the process by providing data directly as requested or through data contained on their websites or as maintained by their offices. Further as part of the public outreach process, all groups were invited to attend the public meetings and to review and comment on the plan prior to submittal to Cal OES and FEMA. In addition, as part of the review of the draft plan, key agency stakeholders were contacted, and their comments specifically solicited. Emergency managers in adjacent counties (Kern, Monterey, and Santa Barbara) were contacted by the County emergency services coordinator via email and asked to provide comments on the public review draft of the plan. The Emergency Manager for Santa Barbara County provide comments during this review period. The comments were integrated into Section 4 Community Profile to provide clarity and make the plan more accurate.

This process accomplished as part of planning steps two and three in the FEMA Local Mitigation Planning Handbook.

Incorporation of Existing Plans and Other Information

The coordination and synchronization with other community planning mechanisms and efforts are vital to the success of this plan. To have a thorough evaluation of hazard mitigation practices already in place, appropriate planning procedures should also involve identifying and reviewing existing plans, policies, regulations, codes, tools, and other actions are designed to reduce a community's risk and vulnerability from natural hazards. San Luis Obispo County uses a variety of mechanisms to guide growth and development. Integrating existing planning efforts, mitigation policies, and action strategies into this plan establishes a credible, comprehensive document that weaves the common threads of a community's values together. The development and update of this plan involved a comprehensive review of existing plans, studies, reports, and initiatives from the County of San Luis Obispo and each participating municipality that relate to hazards or hazard mitigation. A high-level summary of the key plans, studies and reports is summarized in the table below. Information on how they informed the update are noted and incorporated where applicable.

Table 3-5 Summary of Review of Key Plans, Studies and Reports

Plan, Study, Report Name	How Plan informed LHMP
County of San Luis Obispo General Plan and Elements (Safety, Agricultural, Conservation and Open Space, Land Use)	Provided background information on the county including some information related to jurisdictions. The elements were used to provide information on risk and vulnerabilities to hazards and the existing policies the County has in place related to hazards and mitigation.
Municipal General Plans (including Safety Elements, Land Use Elements, and Housing Elements)	Informed the municipal annexes and in some cases the community service district annexes on past hazard events, mitigation policies, combining designations and existing and projected development
Local Hazard Mitigation Plans (City of Atascadero, City of Morro Bay, City of Paso Robles, City of Pismo Beach, City of San Luis Obispo, Los Osos CSD and the City Arroyo Grande/ City Grover Beach/Lucia Mar Unified School District/South San Luis Obispo County Sanitation District)	Informed the HIRA sections, mitigation action plans and capability assessments for the applicable annexes
Area Plans (Estero, Inland, North Coast, San Luis Bay Coastal, South County Coastal)	Informed the community and district profiles
Community Plans (Avila Beach, San Miguel, Nipomo, Los Osos)	Informed the community service district profiles
Urban Water Management Plans (Arroyo Grande, Atascadero)	Informed the drought and water shortage sections of the applicable annexes
San Luis Obispo County Flood Insurance Study	Reviewed for information on past floods and flood problems to inform risk assessment (Section 4) Utilized Digital Flood Insurance Rate Maps effective January 2016 to update maps and flood risk assessment in Section 4.
State of California Multi-Hazard Mitigation Plan (draft 2018)	Reviewed information on climate change and hazard assessment data to ensure consistency with this plan update Reviewed list of hazards to inform risk assessment (Section 4) Reviewed goals for consistency during the update of the Fresno Multi-jurisdictional Hazard Mitigation Plan
NOAA National Centers for Environmental Information-State Climate Summaries	Reviewed information on climate change to inform risk assessment (Section 4)
California Department of Finance/U.S. Census Bureau, American Community Survey, 2013-2017	Informed the background on the community including demographic trends
2018 Economic Profile, San Luis Obispo Chamber of Commerce	Informed the economic section of the Community Profile including the top employers in the County
California County Level Economic Forecast 2018 -2050, California Department of Transportation Office of State Planning	Informed the development trends section of the Community Profile and how the State is forecasting the County's growth in terms of population, economy and housing production
County of San Luis Obispo EnergyWise Plan, ClimateWise Integrated Climate Change Adaptation Planning in San Luis Obispo, California's Fourth Climate	Inform climate change projections and possible effects on the County and the "climate change considerations" for each hazard profiled



Plan, Study, Report Name	How Plan informed LHMP
Change Assessment: Central Coastal Region Report (2018)	
San Luis Obispo County Integrated Regional Water Management Plan (Draft 2019) and San Luis Obispo County Stormwater Resource Plan	Informed the background section on adverse weather in general. Including how the county is divided into watershed groups and annual precipitation information
USDA Risk Management Agency Crop Indemnity Reports, 2015-2018	Informed the adverse weather section vulnerability assessment on how crops have been impacted by weather events in the past. Also informed the Drought and Agricultural Pests and Disease sections of the HIRA
California Climate Adaptation Strategy, 2018 and California OES Contingency Plan for Excessive Heat Emergencies (2014)	Informed the Extreme Heat profile and climate change considerations
Dam and Levee Failure Evacuation Plan, County of San Luis Obispo	Informed the Dam Failure profile and vulnerability assessment and provided information on levees of concern in the Flood profile. Also informed applicable jurisdictional annexes
Land Subsidence from Groundwater Use in California (2013) James W. Borchers and Michael Carpenter, Luhdorff & Scalmanni Consulting Engineers	Informed the Land Subsidence profile
Tsunami Response Plan, County of San Luis Obispo	Informed the Tsunami profile the base plan HIRA and applicable jurisdictional annexes
Community Wildfire Protection Plan, San Luis Obispo County (March 2019)	Informed the Wildfire profile in the base plan HIRA and applicable jurisdictional annexes
Community Health Assessment, County of San Luis Obispo Health Agency	Provided background information on the county and informed the biological agents

Other technical data, reports and studies were reviewed and considered, as appropriate, during the collection of data to support Planning Steps 4 and 5, which include the hazard identification, vulnerability assessment, and capability assessment. Information from the following agencies and groups in were reviewed in the development and update of this plan. Specific references relied on in the development of this plan are also sourced throughout the document as appropriate.

- California Department of Forestry and Fire Protection
- California Department of Parks and Recreation Office of Historic Preservation
- California Department of Transportation
- California Department of Public Health
- California Natural Resources Agency
- California Department of Water Resources
- California Geological Survey
- County of San Luis Obispo Agricultural Department
- County of San Luis Obispo Public Health Department
- County of San Luis Obispo Information Technology Department
- County of San Luis Obispo Planning and Building Department
- County of San Luis Obispo Public Works Department
- County of San Luis Obispo Office of Emergency Services



- California Coastal Commission
- California Water Foundation
- San Luis Obispo County Flood Control and Water Conservation District
- National Oceanic and Atmospheric Administration National Climatic Data Center
- National Register of Historic Places
- Natural Resource Conservation Service
- National Weather Service
- U.S. Fish and Wildlife Service
- U.S. Geological Survey
- Western Regional Climate Center
- San Luis Tribune
- Center for Western Weather and Water Extremes

Integration of 2014 Plan into Other Plans and Planning Mechanisms

In addition, the 2014 hazard mitigation was incorporated into several County plans and planning mechanisms. The risk assessment informed the update of the County Emergency Operations Plan. Mitigation projects were proposed as part of County work plans for actual implementation related to drought and fire. On December 3, 2013, the County Board of Supervisors approved an amendment to the San Luis Obispo General Plan Safety Element by Resolution 2013-296. Through this amendment effective January 2, 2014, the Local Hazard Mitigation Plan was incorporated by reference in compliance with California Assembly Bill 2140, stating:

“The San Luis Obispo County Local Hazard Mitigation Plan presents a comprehensive risk assessment of natural hazards that have the potential to affect San Luis Obispo County. The Local Hazard Mitigation Plan was developed by the County in accordance with the federal Disaster Mitigation Act of 2000, adopted by the Board of Supervisors and approved by the Federal Emergency Management Agency. The Local Hazard Mitigation Plan suggests possible mitigation measures for reducing the effects of the potential hazards. It is incorporated by this reference into the Safety Element and should be consulted when addressing known hazards to ensure the general health and safety of people within San Luis Obispo County. The goals and policies within this Safety Element support and are consistent with the recommended mitigation strategy within the Local Hazard Mitigation Plan.”

The 2019 HMP update was coordinated with and done in parallel with the update of the 1999 Safety Element of the County General Plan to ensure consistency of policies.

Several of the participating jurisdictions previously participated in other single or multi-jurisdictional plans, primarily the municipalities. Where those plans have been integrated into other planning mechanisms is noted in the ‘Mitigation Planning History and 2019 Process’ in the jurisdictional annexes.

3.4.2 Phase 2: Assess Risks

Planning Step 4: Identify the Hazards

Wood led the HMPC in an effort to review the list of hazards identified in the 2014 plan and document all the hazards that have, or could, impact the planning area, including documenting recent drought, flood, wildfire and winter storm events. Data collection worksheets were used in this effort to aid in determining hazards and vulnerabilities and where risk varies across the planning area. The profile of each of these



hazards was then updated in 2019 with information from the HMPC and additional sources. Web resources, existing reports and plans, and existing GIS layers were used to compile information about past hazard events and determine the location, previous occurrences, probability of future occurrences, and magnitude/severity of each hazard. Geographic information systems (GIS) were used to display, analyze, and quantify hazards and vulnerabilities where data permitted. The potential for climate change to affect the frequency and intensity of the hazards was summarized based on latest available science, where applicable. A more detailed description of the hazard identification and risk assessment process and the results are included in Section 5 Risk Assessment.

Planning Step 5: Assess the Risks

After updating the profiles of the hazards that could affect the County, the HMPC collected information to describe the likely impacts of future hazard events on the participating jurisdictions. This step included two parts: a vulnerability assessment and a capability assessment.

Vulnerability Assessment—Participating jurisdictions updated their assets at risk to natural hazards—overall and in identified hazard areas. These assets included total number and value of structures; critical facilities and infrastructure; natural, historic, and cultural assets; and economic assets. The HMPC also analyzed development trends in hazard areas. The latest DFIRM was used to refine the estimate flood losses during the update, where available for the NFIP participating communities.

Capability Assessment—The HMPC also conducted a capability assessment update to review and document the planning area’s current capabilities to mitigate risk and vulnerability from natural hazards. By collecting information about existing government programs, policies, regulations, ordinances, and emergency plans, the HMPC can assess those activities and measures already in place that contribute to mitigating some of the risks and vulnerabilities identified. This information for the County is included in Section 6 and in the respective jurisdictional annexes. This addressed FEMA planning task 4: Review community capabilities - 44 CFR 201.6 (b)(2) & (3).

Results of the risk assessment was presented, and comments discussed at the second meeting of the HMPC in April 2019.

A more detailed description of the risk assessment process and the results are included in Section 5 Risk Assessment.

3.4.3 Phase 3: Develop the Mitigation Plan

Planning Step 6: Set Goals

Wood facilitated a discussion session with the HMPC to review the 2014 plan’s goals and objectives. The HMPC discussed definitions and examples of goals, objectives, and actions and considered the goals of the state hazard mitigation plan and other relevant local plans when reviewing and revising the goals and objectives. The resulting updated goals and objectives are presented in Section 7 Mitigation Strategy.

Planning Step 7: Review Possible Activities

Wood facilitated a discussion at an HMPC meeting to review the alternatives for mitigating hazards. This included a brainstorming session with the HMPC to identify a comprehensive range of mitigation actions for each identified hazard, and a method of selecting and defending recommended mitigation actions using a series of selection criteria. More specifics on the process and the results of this collaborative process are captured in Section 7 Mitigation Strategy.

As part of the review of mitigation options long term climate change adaptation strategies were also discussed. HMPC members were encouraged to incorporate climate change adaptation measures into the mitigation strategy of their respective jurisdictions utilizing resources and guidance available on the Cal-Adapt website.

Planning Step 8: Draft an Action Plan

Based on input from the HMPC regarding the draft risk assessment and the goals and activities identified in Planning Steps 6 and 7, Wood produced a complete first draft of the plan. This complete was shared electronically with the HMPC for review and comment. Other agencies were invited to comment on this draft as well. HMPC and agency comments were integrated into the second draft, which was advertised and distributed to collect public input and comments. Wood integrated comments and issues from the public, as appropriate, along with additional internal review comments and produced a final draft for the California Office of Emergency Services and FEMA Region IX to review and approve, contingent upon final adoption by the governing boards of each participating jurisdiction.

3.4.4 Phase 4: Implement the Plan and Monitor Progress

Planning Step 9: Adopt the Plan

In order to secure buy-in and officially implement the plan, the plan was adopted by the governing boards of each participating jurisdiction on the dates included in the adoption resolutions in Appendix D: Adoption Resolutions. The final plan will be included in the safety element of the County General Plan and result in the County's eligibility for Assembly Bill (AB) 2140. This adoption makes the jurisdiction eligible for consideration for part or all of its local costs on eligible public assistance to be provided by State share funding through the California Disaster Assistance Act.

Planning Step 10: Implement, Evaluate, and Revise the Plan

The true worth of any mitigation plan is in the effectiveness of its implementation. Up to this point in the plan update process, all of the HMPC's efforts have been directed at researching data, coordinating input from participating entities, and updating and developing appropriate mitigation actions. Each recommended action includes key descriptors, such as hazard(s) addressed, lead manager and priority, to help initiate implementation. An overall implementation strategy is described in Section 8 Plan Implementation and Monitoring.

Finally, there are numerous organizations within the San Luis Obispo County planning area whose goals and interests' interface with hazard mitigation. Coordination with these other planning efforts, as addressed in Planning Step 3, is paramount to the ongoing success of this plan and of mitigation in San Luis Obispo County and is addressed further in Section 8. A plan update and maintenance schedule and a strategy for continued public involvement are also included in Section 8.

Implementation and Maintenance Process: 2014 Plan

The 2014 LHMP included a process for implementation and maintenance which was generally followed, with some variation. Implementation of the plan including the status of mitigation actions is captured in Section 7 and the jurisdictional annexes. In general, the County and participating jurisdictions have made progress in the implementation of the plan. Successes of note are detailed in Section 7. An updated implementation and maintenance section can be referenced in Section 8.



SECTION 4 SAN LUIS OBISPO COUNTY PROFILE

4.1 County History

The area that today comprises San Luis Obispo County was home to the Chumash people thousands of years before the present age. Important settlements existed in many coastal areas such as Morro Bay and Los Osos.

Mission San Luis Obispo de Tolosa was founded on September 1, 1772 in the area that is now the City of San Luis Obispo. The namesake of the mission, city and county is Saint Louis of Toulouse, the young bishop of Toulouse (Obispo and Tolosa in Spanish) in 1297.

San Luis Obispo County, the 16th largest County in California, is one of the original 27 California counties created by Act of the State Legislature on February 18, 1850.

4.2 Geography

Located along California's Central Coast, San Luis Obispo County is midway (190 miles/306 kilometers) between Los Angeles and San Francisco and is accessible north-to-south by U.S. Highway 101 and scenic Highway 1. Routes from the east include State Highways 41, 46, 58 and 166. San Luis Obispo County is bordered by Santa Barbara County to the south, Monterey County to the north and Kern County to the east. Kings County shares a small border with San Luis Obispo County at the north east corner of the County.

The County encompasses 3,316 square miles or 2,114,750 acres and stretches along 80 miles of coastline. The highest point is Caliente Mountain (5,104 feet). The lowest point is sea level.

A series of ancient volcanic peaks, referred to as the "nine sisters", lie between Morro Bay and San Luis Obispo. Most notable of the peaks is Morro Rock, often called the sentinel of the Pacific Ocean.

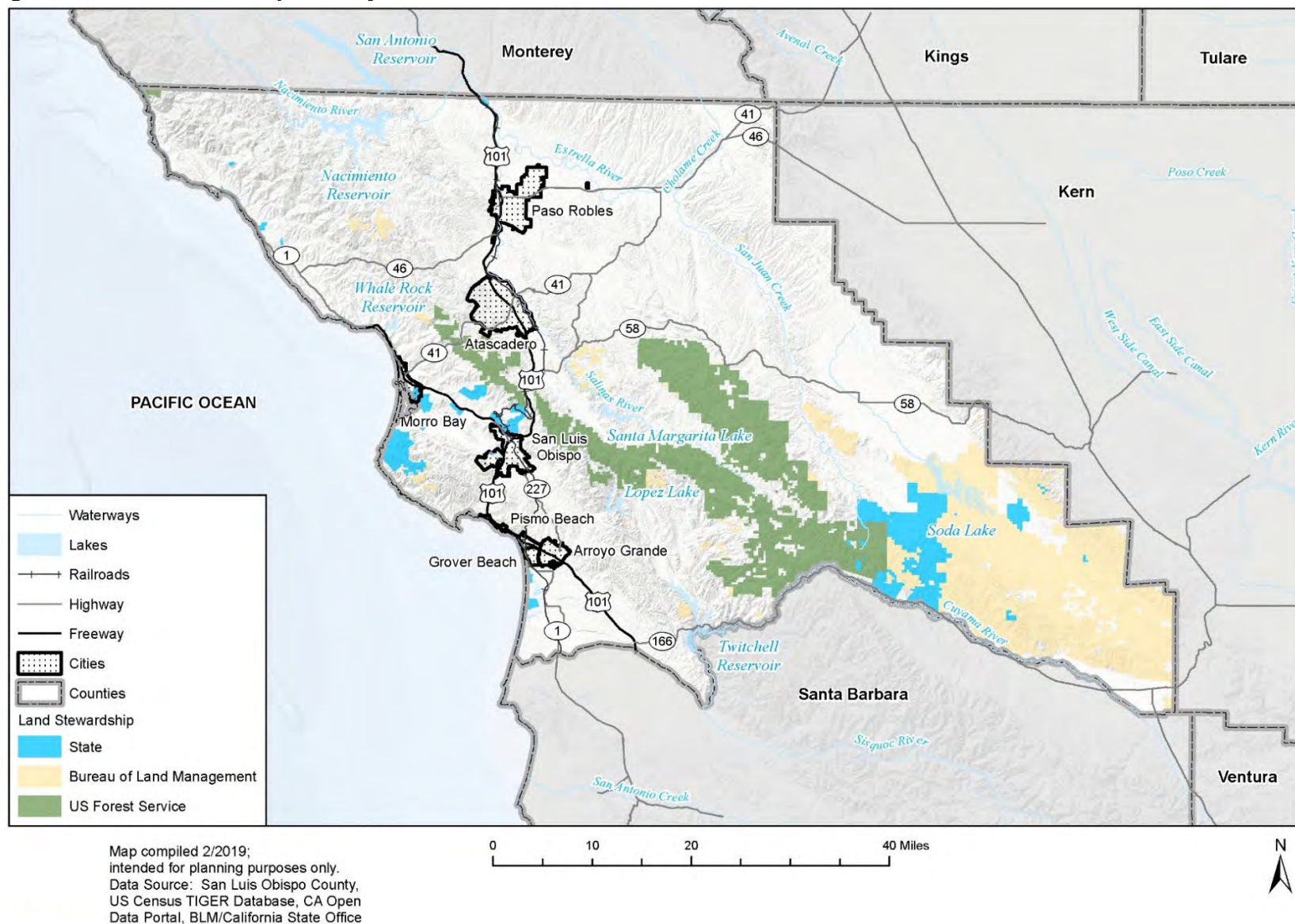
The Central Coast of California is susceptible to a number of natural hazards. This HMP profiles the most significant of these hazards. Historical data, catastrophic potential, relevance to the jurisdiction, and the probability and potential magnitude of future occurrences were all used to reduce and prioritize the list of hazards to those most relevant to San Luis Obispo County.

The following map shows the geography of the County.





Figure 4-1 San Luis Obispo County





4.3 Cities and Communities

The incorporated cities within San Luis Obispo County are:

- Arroyo Grande
- Atascadero
- Grover Beach
- Morro Bay
- Paso Robles
- Pismo Beach
- San Luis Obispo

Unincorporated communities and Census Designated Places (CDP) include:

- Avila Beach
- Blacklake
- Callender
- California Valley
- Cambria
- Cayucos
- Cholame
- Creston
- Edna
- Garden Farms
- Halcyon
- Harmony
- Lake Nacimiento
- Los Berros
- Los Osos-Baywood Park
- Los Ranchos
- Nipomo
- Oak Shores
- Oceano
- Pozo
- San Miguel
- San Simeon
- Santa Margarita
- Shandon
- Templeton
- Whitley Gardens
- Woodlands

In addition to traditionally noted cities and communities, areas such as the Camp Roberts military installation, Camp San Luis, and California Polytechnic State University-San Luis Obispo can be considered communities in and of themselves. San Luis Obispo County works and interacts with these institutions in many ways similar to how the County interacts with other communities outside the scope of this plan. However, it is recognized these listed entities fall under the authority and jurisdiction of the State of California and/or the U.S. Government.

Additionally, the County contains several Community Services Districts (CSDs) or other special districts. California state law allows residents of an unincorporated area to initiate the formation of a community services district to provide any of a wide variety of services, including water, garbage collection, wastewater management, security, fire protection, public recreation, street lighting, mosquito abatement, conversion of overhead utilities to underground, library services, ambulance services, and graffiti abatement. A CSD may span unincorporated areas, multiple cities and/or counties. Once a CSD is formed, the residents elect a board to oversee CSD management and operations.

Following is a list of all CSDs and special districts in San Luis Obispo County. Districts that are participating jurisdictions in this plan update process are **bolded**. Figure 4-2 shows the CSDs and special districts that participated in the 2019 planning process.

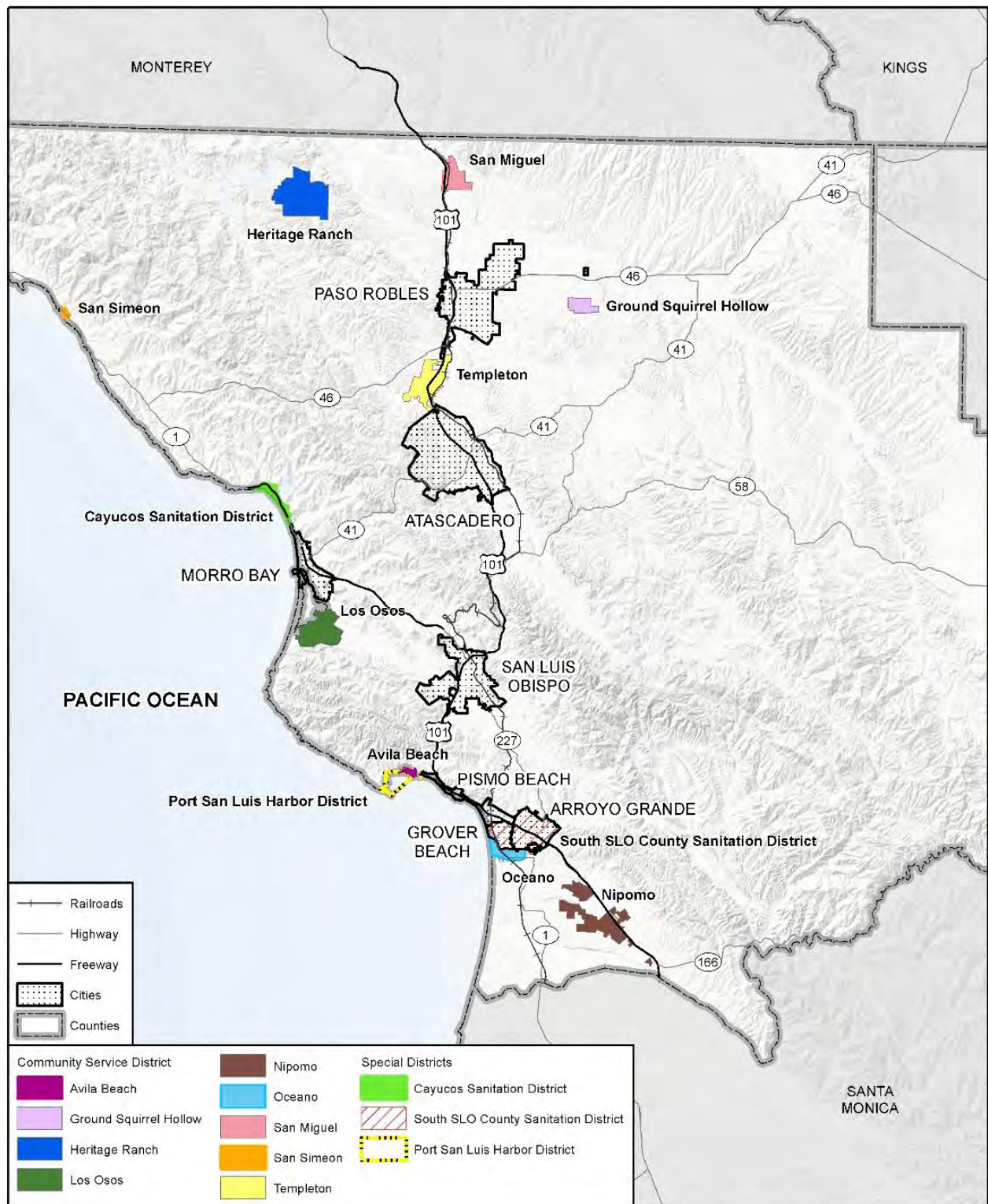




- Arroyo Grande Cemetery District
- Atascadero Cemetery District
- Atascadero Public Financing Authority
- Atascadero Unified School District Educational Facilities Corporation
- **Avila Beach CSD**
- California Valley CSD
- Cambria Cemetery District
- Cambria Community Healthcare District
- Cambria CSD
- Cayucos Fire Protection District
- **Cayucos Sanitary District**
- Cayucos-Morro Bay Cemetery District
- Central California Schools Financing Authority
- Central Coast Cities Joint Powers Self - Insurance Fund - Compensation
- Central Coast Cities Joint Powers Self-Insurance Fund-Liability
- City of Arroyo Grande Public Financing Authority
- City of Pismo Beach Public Facilities Corporation
- Coastal San Luis Resource Conservation District
- County Service Area No. 1
- County Service Area No. 7
- County Service Area No. 9
- County Service Area No. 10
- County Service Area No. 12
- County Service Area No. 16
- County Service Area No. 17
- County Service Area No. 18
- County Service Area No. 21
- County Service Area No. 22
- County Service Area No. 23
- Creston Hills Ranch CSD
- El Paso de Robles Public Financing Authority
- Five Cities Fire Authority
- Garden Farms Community Water District
- **Ground Squirrel Hollow CSD**
- **Heritage Ranch CSD**
- Independence Ranch CSD
- Linne CSD
- **Los Osos CSD**
- **Nipomo CSD**
- Nipomo Lighting District
- **Oceano CSD**
- Paso Robles Cemetery District
- Paso Robles Joint Unified School District Educational Facilities Corporation
- Pismo Beach Public Financing Authority
- **Port San Luis Harbor District**
- San Luis Obispo County Air Pollution District
- San Luis Obispo County Financing Authority
- **San Luis Obispo County Flood Control and Water Conservation District**
- San Luis Obispo County Integrated Waste Management Authority
- San Luis Obispo Public Financing Authority
- San Miguel Cemetery District
- **San Miguel CSD**
- **San Simeon CSD**
- Santa Margarita Cemetery District
- Santa Margarita Fire Protection
- Schools Insurance Program for Employees
- Shandon Cemetery District
- **South San Luis Obispo County Sanitation District**
- Squire Canyon CSD
- Templeton Cemetery District
- **Templeton CSD**
- Templeton Unified School District Educational Facilities Corporation
- Upper Salinas/Las Tablas Resource Conservation District



Figure 4-2 Participating Districts



Map compiled 5/2019;
intended for planning purposes only.
Data Source: San Luis Obispo County,
US Census TIGER Database, CA Open
Data Portal, LAFCO

4.4 Population and Demographics Profile

This section was updated in 2019 using data from the 2012-2017 American Community Survey (ACS) 5-Year Estimates.

Population

The U.S. Census Bureau estimated San Luis Obispo County's total population of 280,119 as of 2017. This constitutes a 4% increase in population from the 2014 plan (269,637 persons). The tables below list the total population estimates for each jurisdiction, and shows how they have changed in the last five years.

Table 4-1 San Luis Obispo County Population Change, 2012-2017

Jurisdiction	2012	2013	2014	2015	2016	2017	% Change 2012-2017
San Luis Obispo County	270,121	272,094	274,184	276,517	278,680	280,119	+4%
Arroyo Grande City	17,284	17,411	17,536	17,720	17,842	17,971	+4%
Atascadero City	28,441	28,613	28,792	29,084	29,516	29,797	+5%
Avila Beach CDP*	NA	NA	1,166	1,270	1,242	1,080	-7%
Cayucos CDP	2,431	2,475	2,553	2,758	2,987	2,847	+17%
Grover Beach City	13,194	13,253	13,337	13,409	13,484	13,524	+3%
Los Osos CDP	14,874	14,177	14,778	15,388	15,603	15,714	+6%
Nipomo CDP	16,747	17,256	17,115	16,727	16,456	16,706	+0%
Oceano CDP	7,543	7,453	7,355	7,857	8,262	7,788	+3%
Paso Robles City	29,770	30,144	30,522	30,863	31,178	31,409	+6%
Pismo Beach City	7,721	7,746	7,789	7,890	7,984	8,060	+4%
San Luis Obispo City	45,328	45,584	45,911	46,337	46,716	46,997	+4%
San Miguel CDP	2,822	2,621	2,638	2,461	2,696	2,824	+0%
San Simeon CDP	513	534	477	284	325	523	+2%
Templeton CDP	7,200	7,525	7,753	7,377	7,525	7,989	+11%

Source: U.S. Census Bureau American Community Survey, www.census.gov/. Avila Beach data not available prior to 2014.

Note: Data for Census Designated Places (CDP) may not have the same boundaries as the participating Community Service Districts.

Table 4-2 and Table 4-3 show several key demographic and social characteristics of San Luis Obispo County, how those characteristics have changed over the last five year, and how those characteristics compare to the rest of the state and nation.



Table 4-2 San Luis Obispo County Demographic and Social Characteristics, 2012-2017

San Luis Obispo County	2012	2017	% Change
Population	270,121	280,119	3.7%
Median Age	39.3	39.0	-0.8%
Total Housing Units	117,318	120,182	2.4%
Housing Occupancy Rate	86.7%	87.4%	0.7%
% of Housing Units with no Vehicles Available	4.5%	4.5%	0.0%
Median Home Value	\$449,300	\$499,800	11.2%
Unemployment	8.7%	4.8%	-3.9%
Mean Travel Time to Work (minutes)	20.9	21.8	4.3%
Median Household Income	\$59,628	\$67,175	12.7%
Per Capita Income	\$30,218	\$33,972	12.4%
% of Individuals Below Poverty Level	13.7%	13.8%	0.1%
# of Households	101,708	105,044	3.3%
Average Household Size	2.49	2.51	0.8%
% of Population Over 25 with High School Diploma	89.5%	90.5%	1.0%
% of Population Over 25 with Bachelor's Degree or Higher	31.5%	34.0%	2.5%
% with Disability	11.1%	11.1%	0.0%
% Speak English less than "Very Well"	6.7%	6.8%	0.1%

Source: U.S. Census Bureau American Community Survey www.census.gov/

Table 4-3 Demographic and Social Characteristics Compared to the State and Nation

Demographic & Social Characteristics (as of 2017)	County	California	U.S.
Median Age	39.0	36.1	37.8
Housing Occupancy Rate	87.4%	92.1%	87.8%
% of Housing Units with no Vehicles Available	4.5%	7.4%	8.8%
Median Home Value	\$499,800	\$443,400	\$193,500
Unemployment	4.8%	7.7%	6.6%
Mean Travel Time to Work (minutes)	21.8	28.8	26.4
Median Household Income	\$67,175	\$67,169	\$57,652
Per Capita Income	\$33,972	\$33,128	\$31,177
% of Individuals Below Poverty Level	13.8%	15.1%	14.6%
Average Household Size	2.51	2.96	2.63
% of Population Over 25 with High School Diploma	90.5%	82.5%	87.3%
% of Population Over 25 with bachelor's degree or Higher	34.0%	32.6%	30.9%
% with Disability	11.1%	10.6%	12.6%
% Speak English less than "Very Well"	6.8%	18.4%	8.5%

Source: U.S. Census Bureau American Community Survey www.census.gov/

Table 4-4 and Figure 4-3 breakdown the demographics of the county by sex, race, and age.

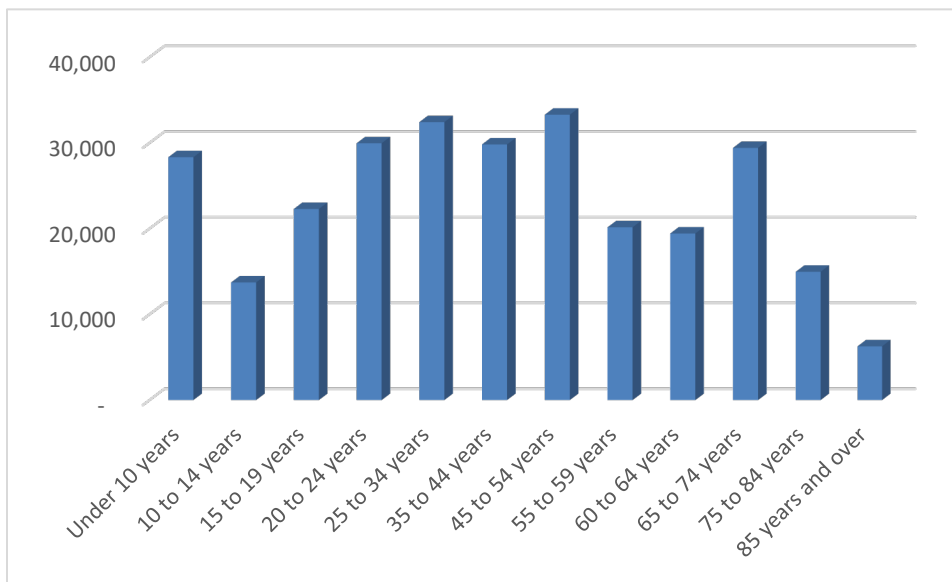


Table 4-4 Demographics by Race and Sex

San Luis Obispo County	Population	%
Total Population	280,119	---
Male	142,182	50.8%
Female	137,937	49.2%
Hispanic or Latino	62,174	22.2%
White alone	194,355	69.4%
Black alone	4,958	18.0%
Asian alone	9,998	3.6%
American Indian and Alaska Native alone	1,237	0.4%
Native Hawaiian and Other Pacific Islander alone	280	0.1%
Some other race alone	109	0.0%
Two or more races alone	7,008	2.5%

Source: U.S. Census Bureau American Community Survey www.census.gov/

Figure 4-3 San Luis Obispo County Population By Age



Housing Characteristics

The 2010 United States Census documented 117,315 housing units, 13 percent of which were vacant. The table below presents the 2017 American Community Survey estimates for types of housing units.

Table 4-5 Types and Total Amounts of Housing Units in San Luis Obispo County

Type of housing units	Total	Percentage
1-unit detached	80,791	67%
1-unit attached	6,527	5.4%
2 units	3,878	3.2%
3 or 4 units	6,190	5.2%
5 to 9 units	5,035	4.2%
10 to 19 units	3,117	2.6%
20 or more units	4,180	3.5%
Mobile home	10,185	8.5%
Boat, RV, van, etc.	279	0.2%
Total housing units	120,182	100%

Source: U.S. Census Bureau American Community Survey www.census.gov/

Occupied Housing Unit Characteristics: According to the 2017 American Community Survey, San Luis Obispo had 120,182 total housing units, of which 105,044 (87.4% were occupied. 60 percent of the occupied housing units were owner-occupied and 40% renter-occupied. More than half the total housing units (52.4%) were built in 1980 or later. However nearly half of residents (45.3%) had been in their current housing for eight years or less. Only 4.5% of occupied housing units have no vehicles available for private use, considerably below state and national averages (7.4% and 8.8% respectively). 67.6% of occupied housing units use utility gas for heating, with another 17.9% using electric heating.

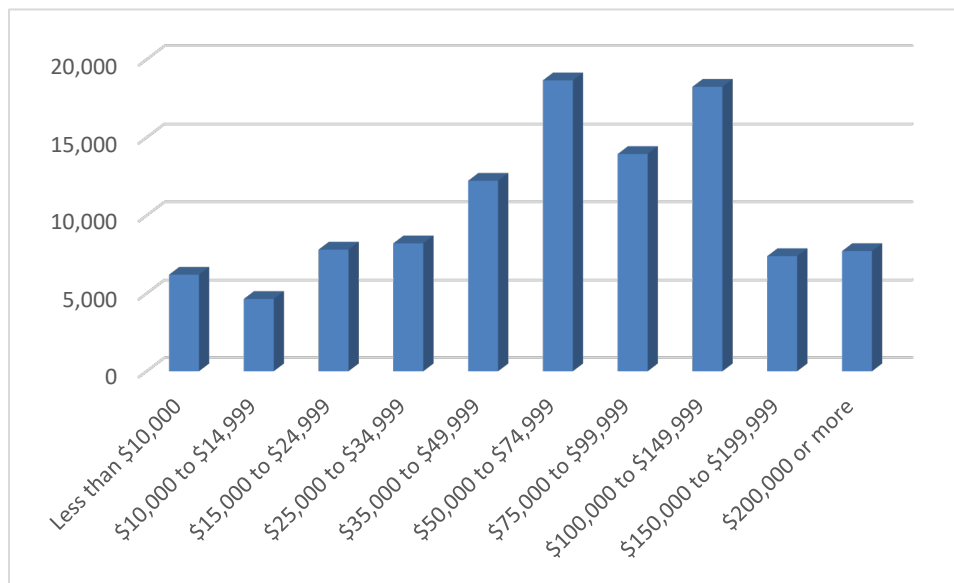
Housing Costs: The median value of owner-occupied housing units in 2017 was \$499,800; this represents an 11.2% increase since 2012, and is 12.7% above the average in California. More than 70% of owner-occupied units were valued between \$300,000 and \$999,999. Eight percent were valued at \$1,000,000 or more. Most owner-occupied units had a mortgage (67.5%). The median rent cost during this time was \$1,326, and 45.9% of renters were paying 35% or more of their income for housing.

Households and Families: In 2017 the average household size was 2.51 persons. There were 105,044 total households, 66,465 (63.3%) of which were family households (62.4%).

Income and Employment: The median household income in 2017 was \$67,175, a 12.7% increase over 2010; this is statistically the same as the statewide average (\$67,169). Per capita income increased similarly during this period, from \$30,218 in 2012 to \$33,972 in 2017. There were 137,680 people in the labor force, with an unemployment rate of 4.8%, down from 8.7% in 2012. Figure 4-4 shows the number of people earning different income levels in the County as of 2017.



Figure 4-4 Income Distribution in San Luis Obispo County



Source: U.S. Census Bureau American Community Survey www.census.gov/

Poverty: In 2017, 13.8% of county residents lived in poverty. 12.9% of related children under 18 were below the poverty level, compared with 6% of people 65 years old and over. 6.6% of all families had incomes below the poverty level, although that number increases to 20.5% for families with a female householder and no husband present.

Language: Among people at least five years old living in San Luis Obispo County in 2017, 81.8% spoke primarily English at home. Spanish was spoken in 14% of homes. A total of 6.8% households reported they spoke English less than “very well”, which is well below the statewide and national averages (18.4% and 8.5% respectively). Since the 2010 census there has been a slight decrease (1.5%) in English as the primary language spoken at home, in the same time period the percentage of individuals who speak Spanish at home and households that reported to speak English less than “very well” increased by 0.9%.

Education: In 2017, 90.5% of people 25 years and over had at least graduated from high school and 34 percent had a bachelor's degree or higher. The total school enrollment in San Luis Obispo County was 77,327 for persons 3 years and over. Nursery school and kindergarten enrollment was 6,484 and elementary or high school enrollment was 33,824 children. College or graduate school enrollment was 37,019.

People with Disabilities: 30,019 persons (11.1%) were living with some form of disability in 2017. This is unchanged from 2012 and is close to statewide and national averages (10.6% and 12.6% respectively).

Health Insurance Coverage: As of 2017, 91.4% of residents had health insurance coverage, including 73.4% with private insurance (alone or with public coverage) and 32.8% with public coverage alone or with private coverage.

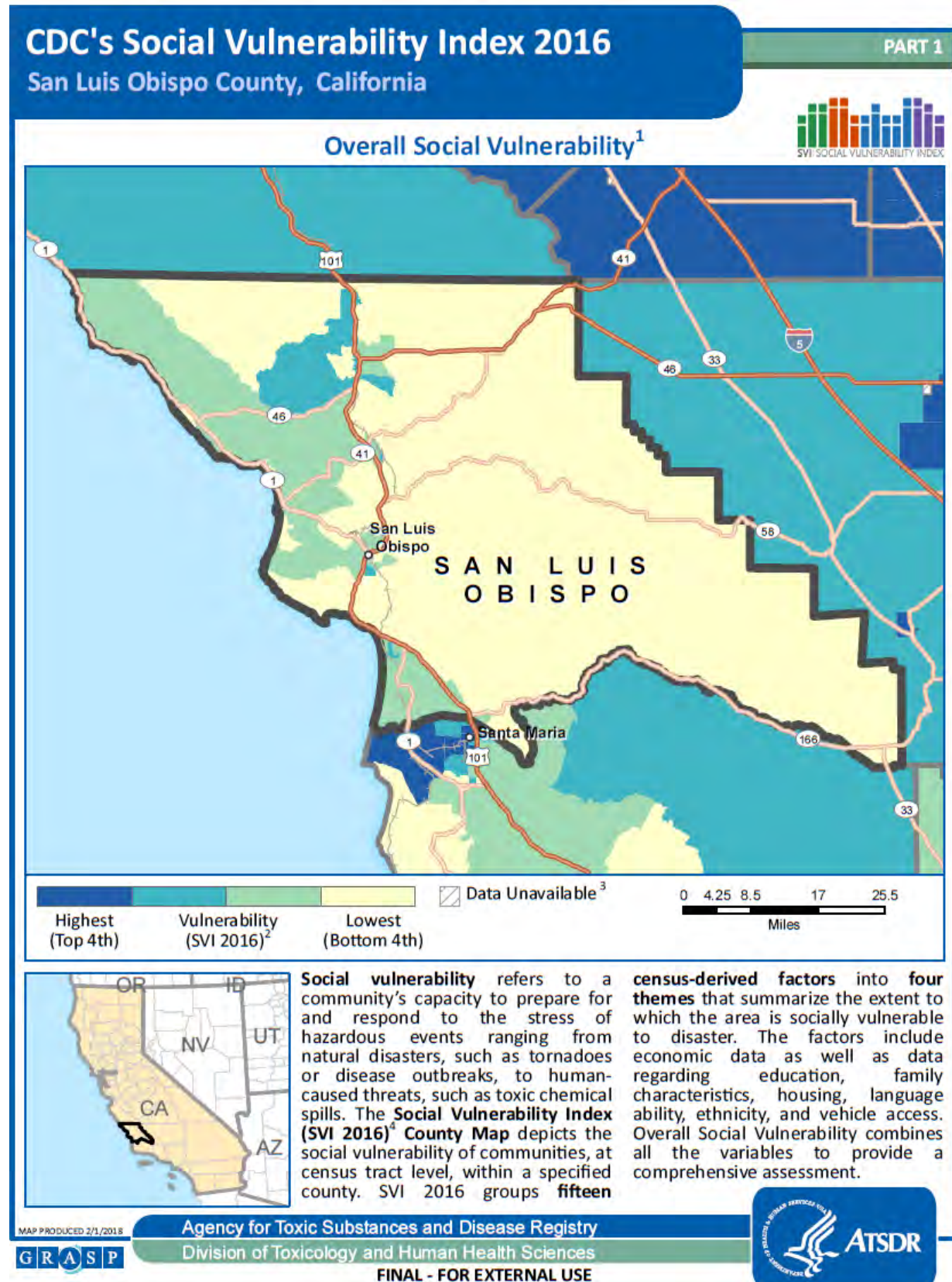
4.4.1 Social Vulnerability

Social vulnerability considerations were included in the update of this plan in 2019 to identify areas across the County that might be more vulnerable to hazard impacts based on a number of factors. A social vulnerability index (SoVI) was developed by the Center for Disease Control's (CDC) Agency for Toxic

Substances and Disease Registry (ATSDR) and their Geospatial Research, Analysis & Services Program teams, as a way to portray communities' capacities to prepare for and respond to natural and man-made disasters. The SoVI does so by providing insight into particularly vulnerable populations to in turn assist emergency response planners and even public health officials identify communities more likely to require additional support before, during, and after a hazardous event. The CDC's SoVI create county- and state-level maps to show relative vulnerability and hence provide key socially and spatially relevant information on communities' populations, and these maps compare the SoVI based on Census Tracts. The overall social vulnerability based on the SoVI data is shown for the County of San Luis Obispo by Census Tracts in Figure 4-5 below, based on statewide ranking. This overall index combines four main themes of vulnerability, namely: socioeconomic status; household composition and disability; minority status and language; and housing and transportation, which in turn are comprised of subcategories for a total of 15 variables accounting for various vulnerability factors. For additional information on the CDC's SoVI, refer to their documentation and materials online at <https://svi.cdc.gov/>.

Based on this data, the areas with the highest level of social vulnerability in the county are Grover Beach, Oceano, southwestern San Luis Obispo City, southeastern Atascadero, southeastern and western Paso Robles, San Miguel, and the Adelaida region.

Figure 4-5 Overall Social Vulnerability in San Luis Obispo based on the SoVI, by Census Tracts



San Luis Obispo County Planning & Building staff also applied the CDC methodology to refine Census Tract level summaries into finer scale aggregation units associated with Census Designated Places (CDP), to provide social vulnerability perspectives on more tangible community centers. The results of this CDP based analysis further informs the vulnerability of people as discussed for each hazard in Section 5; the SoVI data was further used to inform the County's General Plan Safety Element update in 2019. The overall social vulnerability of the County by CDP is portrayed in Figure 4-6. Additional maps using the CDPs and the four main vulnerability themes of the SoVI are shown in Figure 4-7 (socioeconomic vulnerability theme), Figure 4-8 (household composition and disability vulnerability theme), Figure 4-9 (minority status and language vulnerability theme), and Figure 4-10 (housing and transportation vulnerability theme). For additional information on the CDC's SoVI, refer to their documentation and materials online at <https://svi.cdc.gov/>.



Figure 4-6 Overall Social Vulnerability in San Luis Obispo based on the SoVI, by Census Designated Place

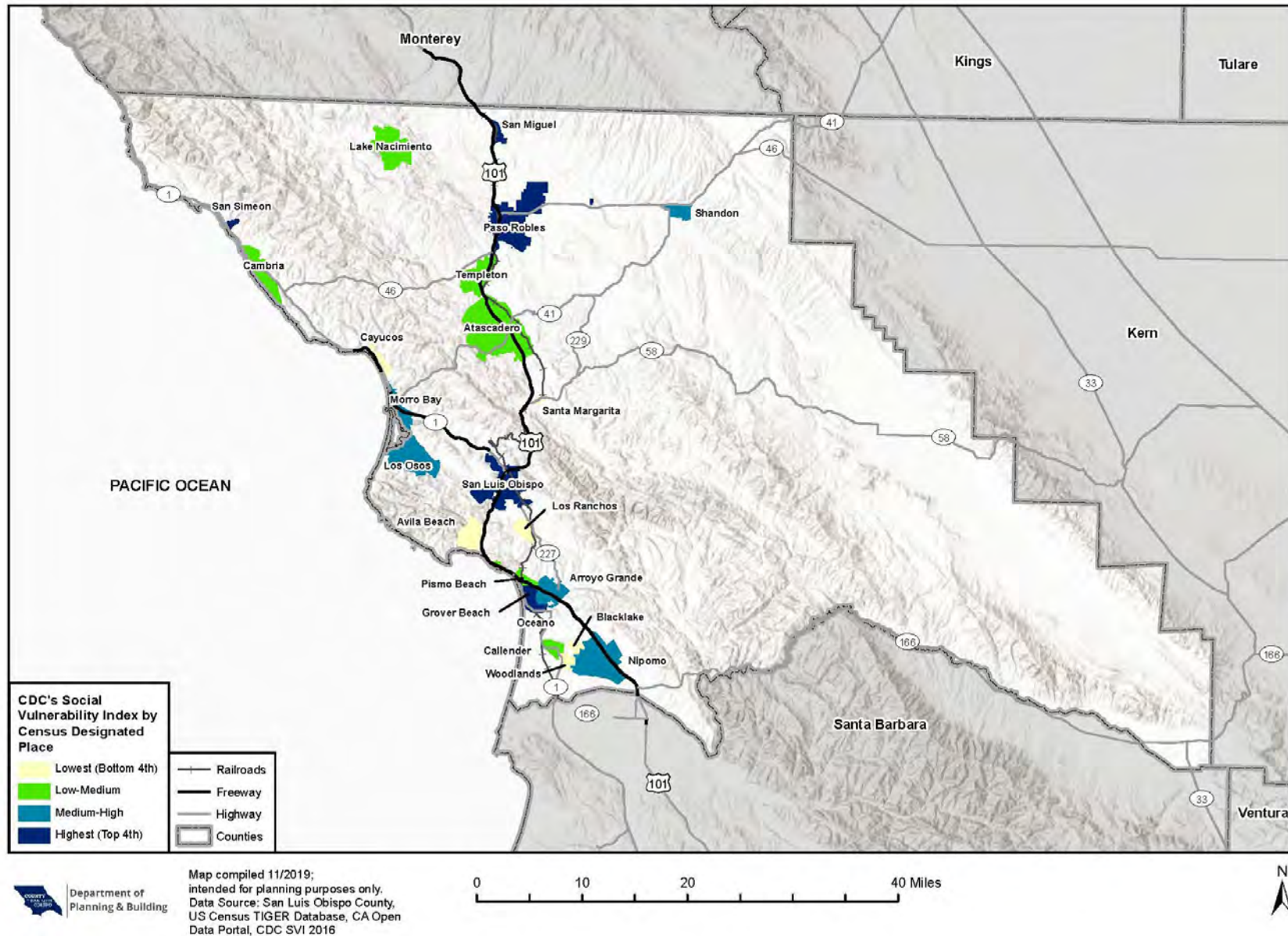


Figure 4-7 Socioeconomic Vulnerability in San Luis Obispo by Census Designated Place

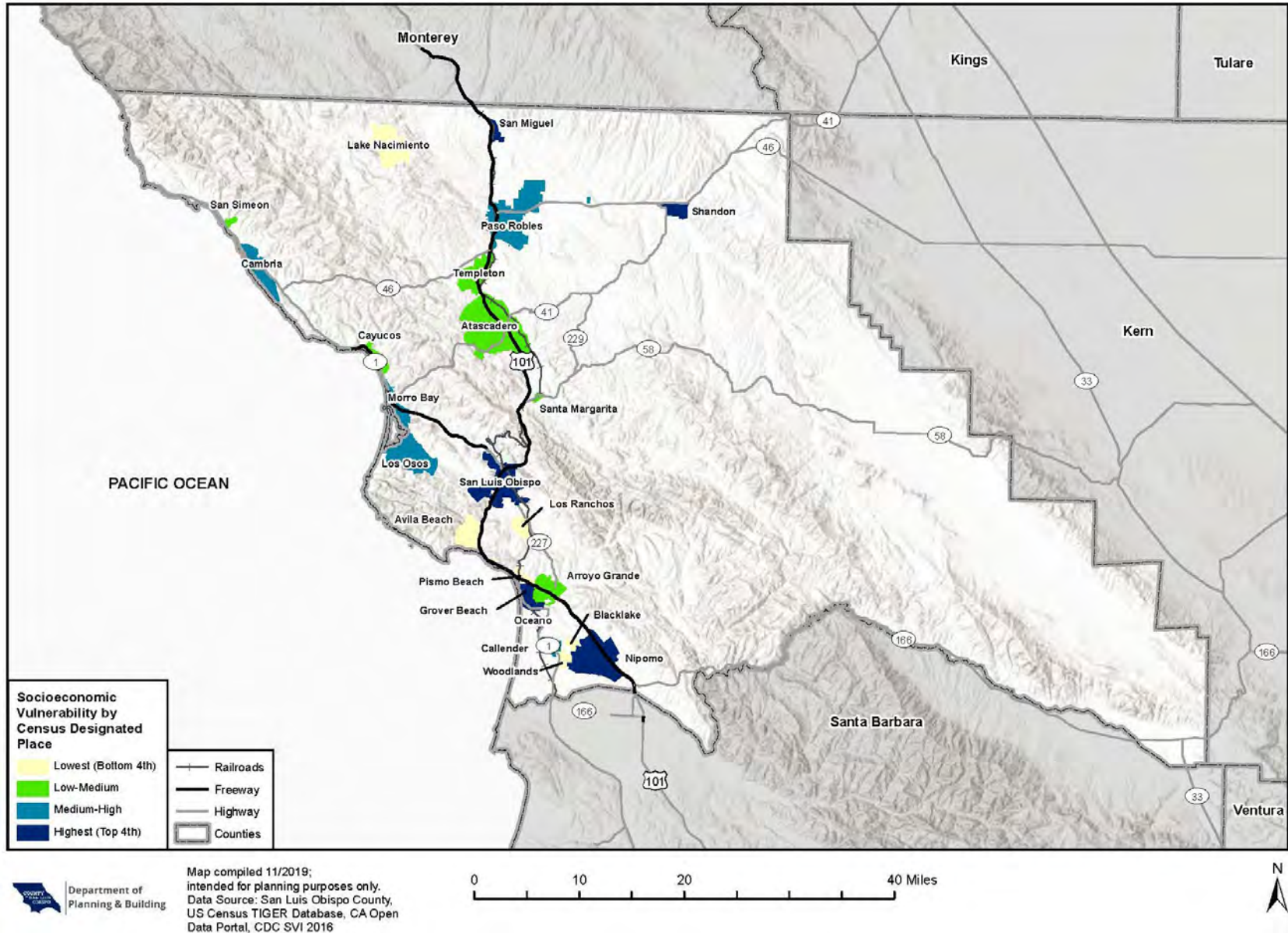


Figure 4-8 Household Composition and Disability Vulnerability in San Luis Obispo by Census Designated Place

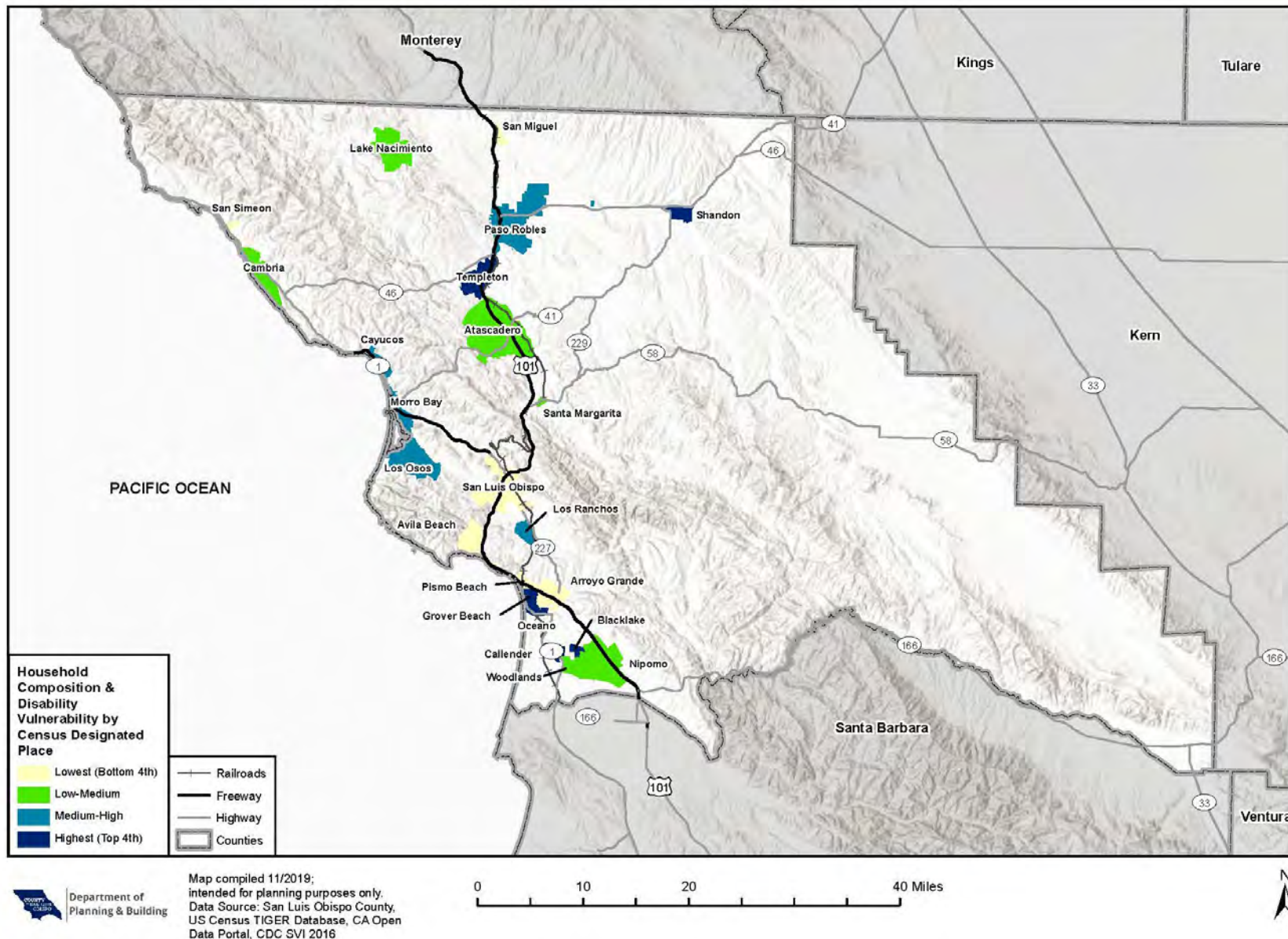


Figure 4-9 Minority and Language Vulnerability in San Luis Obispo by Census Designated Place

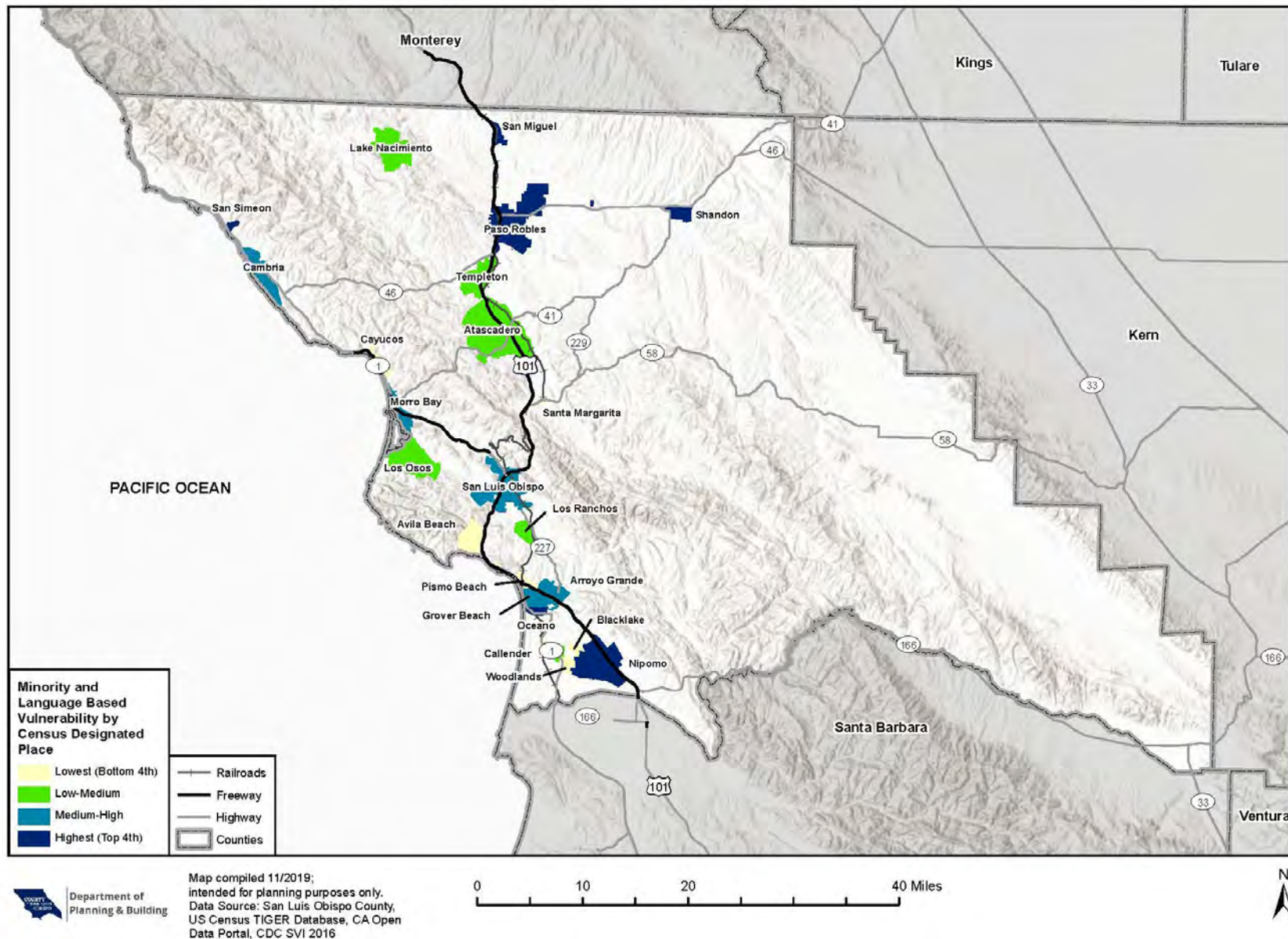
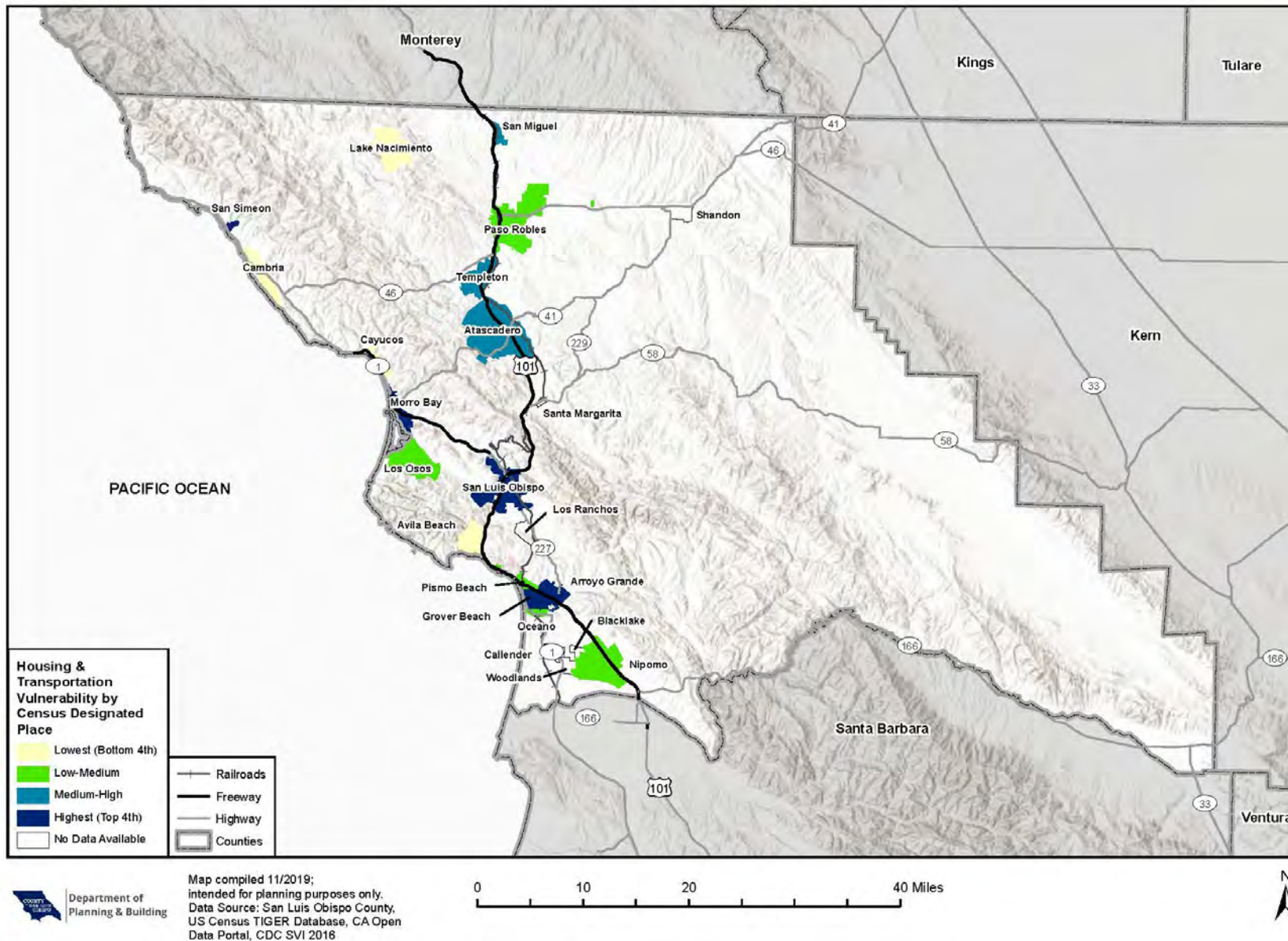


Figure 4-10 Housing and Transportation Vulnerability in San Luis Obispo by Census Designated Place



Environmental Justice Considerations

SB 1000 Requirements §65302(h)(1)

The environmental justice element, or related environmental justice goals, policies, and objectives integrated in other elements, shall do all of the following:

- (A) Identify objectives and policies to reduce the unique or compounded health risks in disadvantaged communities by means that include, but are not limited to, the reduction of pollution exposure, including the improvement of air quality, and the promotion of public facilities, food access, safe and sanitary homes, and physical activity.*
- (B) Identify objectives and policies to promote civil engagement in the public decision-making process.*
- (C) Identify objectives and policies that prioritize improvements and programs that address the needs of disadvantaged communities.*

In 2016 California passed Senate Bill 1000 (SB 1000), the Planning for Healthy Communities Act, requiring cities and counties with disadvantaged communities to include environmental justice (EJ) in their General Plans when they are updating two or more elements of their General Plan concurrently on or after January 1, 2018. Environmental justice is defined by state law as “the fair treatment of people of all races, cultures, and incomes with respect to the development, adoption, implementation, and enforcement of environmental laws, regulations, and policies” (Gov. Code § 65040.12e). SB 1000 defines disadvantaged environmental justice (EJ) communities as those that either 1) rank in the top 25th percentile of the CalEnviroScreen Index, or 2) are low-income and disproportionately affected by exposure to environmental pollution and other hazards that can lead to negative health effects or environmental degradation. This two-part definition creates a “black and white” baseline and another that allows a city or county to cater to its communities through its broad language. Per the first definition, no areas in San Luis Obispo County contain disadvantaged communities. Per the second definition, local jurisdictions may subjectively interpret how to identify disadvantaged communities based on a regional analysis.

This LHMP addresses these considerations to a degree in the social vulnerability assessment for each hazard in Section 5 and prioritization criteria for mitigation actions in Section 7. Prioritization criterion includes a ‘Social’ element which considers applying a higher priority to actions that relate to social equity, benefits disadvantaged communities, or addresses vulnerable populations. In addition, the County of San Luis Obispo adopted Mitigation Action C.1.3 to increase involvement of disadvantaged communities in disaster preparedness activities and prioritize programs that address their needs and incorporated these requirements into the Safety Element of the General Plan during a process parallel to this LHMP update. Other cities and counties may choose to identify disadvantaged communities within their jurisdictions and incorporate the SB 1000 requirements into their planning processes.

4.5 Economy

Table 4-6 breaks down San Luis Obispo County’s labor force by industry as of 2017. The largest sector of employment is in educational services, health care, & social assistance, which makes up 22.2% of jobs in the County. They’re followed by the arts, entertainment, recreation, accommodation, & food services sector (11.8%), retail trade (10.8%), and the professional, scientific, and management, and administrative and waste management services sector (10.0%).

Table 4-6 San Luis Obispo County Employment by Industry (2017)

Industry	# Employed
Population (2017)	280,119
In Labor Force	137,680
Agriculture, forestry, fishing and hunting, and mining	4,480
Armed Forces	1,817
Construction	10,235
Manufacturing	8,841
Wholesale trade	2,820
Retail trade	14,851
Transportation and warehousing, and utilities	5,845
Information	2,012
Finance and insurance, and real estate and rental and leasing	5,842
Professional, scientific, and management, and administrative and waste management services	13,821
Educational services, and health care and social assistance	30,501
Arts, entertainment, and recreation, and accommodation and food services	16,229
Other services, except public administration	6,676
Public administration	7,124
Unemployed	6,586

Source: U.S. Census Bureau American Community Survey 2012-2017 5-Year Estimates, www.census.gov/

The San Luis Obispo Chamber of Commerce published a 2018 Community Economic Profile for the City of San Luis Obispo with additional information about San Luis Obispo County. This section was updated in 2013 to reflect the latest data from the San Luis Obispo Chamber of Commerce.

Employers: The table below reflects the top 25 employers in San Luis Obispo County as reported by the California Employment Development Department.

Table 4-7 Top 25 Employers – San Luis Obispo County

Company/Organization	Location	Industry	Approximate Employees
Employer Name	Location	Industry	Employees
Atascadero State Hospital	Atascadero	Hospitals	1,000-4,999
Cal Poly State University	San Luis Obispo	Schools-Universities & Colleges Academic	1,000-4,999
Glenair Inc	Paso Robles	Communications Consultants	1,000-4,999
Pacific Gas & Electric Co	San Luis Obispo	Electric Companies	1,000-4,999
San Luis Obispo County EMS	San Luis Obispo	Government Offices-County	1,000-4,999
AMI Sierra Vista Radiology	San Luis Obispo	Physicians & Surgeons	500-999
California Mid-State Fair	Paso Robles	Concert Venues	500-999
Cuesta College	Paso Robles	Junior-Community College-Tech Institutes	500-999
Division of Juvenile Justice	Paso Robles	State Govt-Correctional Institutions	500-999
Medi-Cal Eligibility Info	San Luis Obispo	Government Offices-County	500-999



Company/Organization	Location	Industry	Approximate Employees
Mental Marketing	Atascadero	Advertising-Agencies & Counselors	500-999
Sierra Vista Regional Med Ctr	San Luis Obispo	Hospitals	500-999
Trust Rcm	San Luis Obispo	Billing Service	500-999
Arroyo Grande Community Hosp	Arroyo Grande	Hospitals	250-499
Child Abuse-Neglect-Child	San Luis Obispo	Business Management Consultants	250-499
County Office of Education	San Luis Obispo	Schools	250-499
French Hospital Medical Ctr	San Luis Obispo	Hospitals	250-499
Hearst Castle	San Simeon	National Monuments	250-499
Madonna Inn Resort	San Luis Obispo	Resorts	250-499
Morro Bay Art Assn Gallery	Morro Bay	Art Galleries & Dealers	250-499
Ramirez Farm Labor	Shandon	Labor Contractors	250-499
San Luis Obispo County Social	San Luis Obispo	Government Offices-County	250-499
San Luis Obispo Sheriff's Dept	San Luis Obispo	Sheriff	250-499
Social Services Dept	San Luis Obispo	Government Offices-County	250-499

Source: California Employment Development Department

Agriculture: The agriculture industry in San Luis Obispo is a crucial part of the local economy, providing employment and income directly for those in agriculture, as well as driving growth in the tourism industry. Total crop values in 2017 were \$925 million. The top 20 leading agriculture crops are listed in Table 5-3 in the Risk Assessment section.

4.6 Climate

The climate and air quality of San Luis Obispo County are directly related to its physical characteristics. The coastal lowlands and plains are bounded on the east by the Santa Lucia Mountains and experience a maritime climate. That climate is somewhat modified locally by elevation and distance from the ocean, as well as the mountains. The north and northeastern portions of the County include the upper end of the Salinas Valley, where the maritime climate is substantially modified by the intervening mountains. The Carrizo Plain in the east and southeastern portion of the County is climatically high desert.

Because the County is located along the California coast, the weather is normally under the influence of a high-pressure system located to the west. As a result, a common weather pattern includes afternoon and evening onshore winds.

San Luis Obispo County has a pleasant, Mediterranean climate year-round, averaging 315 days of sunshine per year.

- Winter: 64°F / 31°F - Cool and Sunny
- Spring: 75°F / 44°F - Breezy and Cool
- Summer: 94°F / 54°F - Warm Coastal Mornings/Sunny Days
- Fall: 77°F / 43°F - Warm Days and Cool Nights



The 2010 & 2011 Annual Air Quality Report issued by the San Luis Obispo Air Pollution Control District notes that the County overall had good air quality. However ozone levels exceeding both federal and state standards were measured on numerous days in the rural eastern portion of the county due to transported pollution. Smoke from wildfires can often adversely affect air quality. South County air quality was impacted by dust blown from the dune complex along the coast of the Five Cities area. Only one exceedance of the federal PM10 standard occurred in 2010, but numerous exceedances of the state standard were recorded during this time frame. The County attained both federal and state standards for fine particulate matter, carbon monoxide, nitrogen dioxide, sulfur dioxide, hydrogen sulfide, and visibility. An overview of the effects of climate change on San Luis Obispo County can be found in subsection 5.1.3.

4.7 Transportation Systems

The County contains major transportation arteries including U.S. Highway 101, California State Highways 1, 41, 46, 58, and 166, and the Union Pacific Railroad. The County has a regional airport near the southern portion of the City of San Luis Obispo which offers service to larger commercial airports to the north and south (Los Angeles and San Francisco, as well as flights to Phoenix). In addition to air transportation, the County is also served with scheduled rail service by Amtrak, and motor bus service by companies such as Greyhound and Orange Belt Stages, as well as a number of tour coach operators, and local transit systems.

4.8 Governing Body

The Board of Supervisors serves as the Legislative body of the County of San Luis Obispo for the planning and provision of services related to public needs and the requirements of State and Federal laws. California law provides for five Supervisors to be elected by district. Each Supervisor is elected for a four-year term. Two of the Supervisors' terms are staggered so that all Supervisors are not standing for election at the same time. As the elected representative of the people of San Luis Obispo County, the Board of Supervisors establishes overall County priorities and sets policy.

The San Luis Obispo County Flood Control and Water Conservation District is operated by the County Water Resources Division of Public Works. The District (Public Works Department) is the designated County agency responsible for managing, planning, and maintaining drainage and flood control facilities in the unincorporated public areas where no other agency has assumed an active role in such activities. The District has a regional role in the County and can work with individual cities or communities when requested. The County Board of Supervisors also serves as the governing body for the Flood Control District.

4.9 Land Use

Existing land use within San Luis Obispo County is varied with respect to types of uses, ownership, character, and intensity. Land uses include:

- Rural residential
- Single family detached
- Single family attached
- High-density residential (apartments)
- Mobile homes
- Recreational open space
- Other open space
- Heavy industrial
- Warehouse
- Vacant

- Agriculture
- Water
- Utilities
- Public facilities
- Schools
- Retail / Office
- Tourist / Commercial recreation
- Light industrial / Business park
- Mineral extraction

4.10 Development Trends

While the population of San Luis Obispo County is expected to continue growing, there are Land Use policies and elements within the County General Plan to help assure orderly development.

The California Department of Transportation's Office of State Planning prepared the *California County-Level Economic Forecast 2018-2050*. Highlights of the forecast for San Luis Obispo County include:

- From 2018 to 2023, employment growth is expected to average 0.9 percent per year.
- The largest employment gains will be observed in education and healthcare, leisure services, and government. Together, these sectors will account for 61 percent of net job creation during the 2018-2023 period.
- Average salaries are currently below the California average, and will remain so over the foreseeable future. In San Luis Obispo County, inflation-adjusted salaries are expected to rise by an average of 1.8 percent per year between 2018 and 2023, which will be similar to statewide growth.
- Over the forecast period, an average of 970 homes will be authorized per year. Because San Luis Obispo County has large amounts of buildable land, housing production will spread out into single-family communities, rather than be forced up into multifamily skyscrapers.
- The population is expected to increase by 0.4 percent annually through 2023. Net migration will account for almost all population growth. Because the County has an old population base, the number of deaths will be approximately equal to the number of births during the forecast period.

Table 4-8 San Luis Obispo County Economic Forecast, 2017-2050

San Luis Obispo County	2018	2050
Population (people)	279,967	298,795
Net Migration (people)	1,326	710
Registered Vehicles (thousands)	315	355
Households (thousands)	105.7	124.9
New Homes Permitted (homes)	1,111	303
Total Taxable Sales (billions)	\$5.36	\$19.35
Personal Income (billions)	\$16.14	\$54.75
Real Per Capita Income (dollars)	\$56,044	\$85,431
Inflation Rate (% change in CPI)	2.7	1.9
Real Farm Crop Value (millions)	967.2	1234.3
Real Industrial Production (millions)	2,493	4,698
Unemployment Rate (percent)	3.3	3.8
<u>Employment (thousands of jobs)</u>		
Total Wage & Salary	123.8	144.5
Farm	5.2	6.4



San Luis Obispo County	2018	2050
Construction	7.7	5.5
Manufacturing	7.3	7.9
Transportation & Utilities	4.1	3.9
Wholesale & Retail Trade	17.5	22.3
Financial Activities	4.2	4.4
Professional Services	10.7	13.4
Information	1.4	1.4
Health & Education	15.7	19.7
Leisure	19.3	23.5
Government	24.8	29.5

Source: *California County-Level Economic Forecast 2018-2050*, California Department of Transportation

Analysis of development trends in the County can be found in subsection 5.2, to include analysis of building permits. Additional discussion on development trends can be found in the Future Development section of each hazard profile in the Section 5.



SECTION 5 RISK ASSESSMENT

DMA Requirement §201.6(c)(2):

[The plan shall include] A risk assessment that provides the factual basis for activities proposed in the strategy to reduce losses from identified hazards. Local risk assessments must provide sufficient information to enable the jurisdiction to identify and prioritize appropriate mitigation actions to reduce losses from identified hazards.

Risk, for the purposes of this plan and as defined by FEMA, is a combination of hazard, vulnerability, and exposure. "It is the impact that a hazard would have on people, services, facilities, and structures in a community and refers to the likelihood of a hazard event resulting in an adverse condition that causes injury or damage."

The risk assessment process identifies and profiles relevant hazards and assesses the exposure of lives, property, and infrastructure to these hazards. The process allows for a better understanding of a jurisdiction's potential risk to hazards and provides a framework for developing and prioritizing mitigation actions to reduce risk from future hazard events.

This risk assessment builds upon the methodology described in the 2013 FEMA Local Mitigation Planning Handbook, which recommends a four-step process for conducting a risk assessment:

1. Describe Hazards
2. Identify Community Assets
3. Analyze Risks
4. Summarize Vulnerability

In essence, the risk assessment evaluates potential loss from hazards by assessing the vulnerability of the county's population, build environment, critical facilities, and other assets. Data collected through this process has been incorporated into the following sections of this section:

Subsection 5.1: Hazard Identification - identifies the hazards that threaten the Planning Area and describes why some hazards have been omitted from further consideration.

Subsection 5.2: Asset Summary - describes the methodology for inventorying assets as the basis for determining vulnerability of the planning area to the identified hazards.

Subsection 5.3: Hazard Analysis and Risk Assessment - discusses the threat to the Planning Area and describes previous occurrences of hazard events and the likelihood of future occurrences (2013 FEMA Local Mitigation Planning Handbook Risk Assessment Step 1). It also includes a vulnerability assessment considering assets at risk, critical facilities, and future development trends (2013 FEMA Local Mitigation Planning Handbook Risk Assessment Steps 2, 3 and 4).

This risk assessment covers the entire geographical area of San Luis Obispo County. Since this plan is a multi-jurisdictional plan, the HMPC was required to evaluate how the hazards and risks vary from jurisdiction to jurisdiction. While these differences are noted in this section, they are expanded upon in the annexes of the participating jurisdictions. If no additional data is provided in an annex, it should be assumed that the risk and potential impacts to the affected jurisdiction are similar to those described here for the entire San Luis Obispo County planning area.



5.1 Hazard Identification and Prioritization

DMA Requirement §201.6(c)(2)(i):

[The risk assessment shall include a] description of the type of all-natural hazards that can affect the jurisdiction.

The first step in developing a risk assessment is identifying the hazards. The San Luis Obispo County HMPC conducted a hazard identification study to determine the hazards that threaten the planning area.

5.1.1 Methodology and Results

The Central Coast region of California is susceptible to a number of hazards. This HMP profiles the most significant of these hazards. Historical data, catastrophic potential, relevance to the jurisdiction, and the probability and potential magnitude of future occurrences were all used to reduce and prioritize the list of hazards to those most relevant to San Luis Obispo County.

Using existing natural hazards data and input gained through planning meetings during both the 2014 HMP and 2019 update, the HMPC agreed upon a list of hazards that could affect San Luis Obispo County. The following table explains the changes in the hazards profiled in 2014 and the 2019 update. Bolded hazards are new to the plan.

Table 5-1 Updates to Hazards Profiled, 2014 Plan and 2019 Update

2019 Hazards	How and Why Identified	Comments
Adverse weather: extreme heat , freeze, hail, wind, dense fog, tornado, thunderstorm	In 2014 Plan	Extreme heat added; drought removed and addressed as a separate hazard
Agricultural pest infestation and plant disease, marine invasive species	In 2014 Plan	Tree mortality included.
Biological agents (naturally occurring)	In 2014 Plan	Pandemic flu, food and water borne illness. Also addressed in other planning mechanisms but a concern to county and history of events. Include Vector Borne Disease
Coastal Storm/Coastal Erosion/ Sea Level Rise	In 2014, sea level rise recommended by HMPC	
Dam Incidents	New in 2014, recommended by HMPC and 2014 FEMA review; identified in local HMPs; in GP Safety Element	Includes flooding from excess releases and failures.
Drought and Water Shortage	In 2014 Plan as part of adverse weather	Separated out from adverse weather as its own hazard as nature of hazard is unique and different consequences; includes ground and surface water shortage; agricultural and viticulture impacts
Earthquake (including fault rupture, groundshaking, liquefaction)	In 2014 Plan	
Floods	In 2014 Plan	Includes riverine and stormwater drainage and levee failure ; coastal flooding addressed in coastal storms section

2019 Hazards	How and Why Identified	Comments
Landslides and Debris Flow	In 2014 Plan	Debris flow included due to potential from wildfire burns
Subsidence	New in 2014, recommended by HMPC; identified in Paso Robles HMP	Consequence of drought due to overdraft of aquifers.
Tsunami and seiche	In 2014 Plan	
Wildfire	In 2014 Plan	
Human Caused: Hazardous Materials	New in 2014, recommended by HMPC; In 1999 General Plan Safety Element; County EOP and several emergency response plans	Includes Fixed Facility and Transportation, Radiological Accidents, Oil spills, Natural Gas Pipeline Rupture & Storage Facilities
Climate Change/Long term climate variability	In 2014 Plan	Climate change considerations incorporated in the hazard profiles to describe how the frequency and intensity of hazards could be altered in the future

In alphabetical order, the natural hazards identified and investigated for the San Luis Obispo County Multi-Jurisdictional Hazard Mitigation Plan include:

- Adverse Weather
 - Extreme Heat
 - Thunderstorm/Heavy Rain/ Lightning/Freeze/Hail/Dense Fog
 - High Wind/Tornado
- Agricultural Pest Infestation and Plant Disease/Marine Invasive Species
- Biological Agents (naturally occurring)
- Coastal Storm/Coastal Erosion/Sea Level Rise
- Dam Incidents
- Drought and Water Shortage
- Earthquake
- Flood
 - Levee Failure
- Landslide and Debris Flow
- Subsidence
- Tsunami
- Wildfire

Human Caused Hazards

- Hazardous Materials
 - Fixed Facility
 - Transportation
 - Radiological Accidents
 - Oil Spills
 - Natural Gas Pipeline Rupture & Storage Facilities

The 2019 HMP update included a significant re-evaluation of the hazards with the latest, best available data. Hazards data from San Luis Obispo County, California Governor's Office of Emergency Services (CA-OES), FEMA, the National Oceanic and Atmospheric Administration, and many other sources were examined to assess the significance of these hazards to the planning area. The update process included a comprehensive, parcel-level risk analysis with GIS where available data permitted. Many new maps and tables were added that capture the potential losses. Additional details on the loss analysis, including a breakdown of hazard losses by jurisdiction and property type can be referenced in Appendix E and the jurisdictional annexes.

Overall Hazard Significance Summary

Overall hazard significance was based on a combination of Geographic Area, Probability of Future Occurrence and Potential Magnitude/Severity as defined below. The individual ratings are based on or interpolated from the analysis of the hazards in the sections that follow. During the 2019 San Luis Obispo County HMP update the individual ratings and significance of the hazards was revisited and updated. Public concern was also considered via input at public meetings and an online survey.

Table 5-2 San Luis Obispo County Hazard Significance

Hazard	Geographic Area	Probability of Future Occurrence	Magnitude/Severity (Extent)	Overall Significance
Adverse Weather: Thunderstorm/Heavy Rain/Hail/Lighting/Dense Fog/Freeze	Significant	Likely	Negligible	Medium
Adverse Weather: High Wind/Tornado	Significant	Likely	Negligible	Low
Adverse Weather: Extreme Heat	Extensive	Occasional	Negligible	Low
Agricultural Pest Infestation and Disease	Limited	Highly Likely	Negligible	Medium
Biological	Extensive	Occasional	Critical	Medium
Dam Incidents	Limited	Unlikely	Critical	Medium
Drought and Water Shortage	Extensive	Likely	Critical	High
Earthquake	Extensive	Occasional	Critical	High
Flood	Significant	Likely	Critical	Medium
Landslides and Debris Flow	Significant	Likely	Critical	Medium
Coastal Storm/Coastal Erosion/Sea Level Rise	Limited	Likely	Limited	Medium
Subsidence	Significant	Occasional	Negligible	Low
Tsunami and Seiche	Significant	Occasional	Limited	Medium
Wildfire	Extensive	Likely	Critical	High
Human Caused: Hazardous Materials	Limited	Highly Likely	Negligible	Low



<p>Geographic Area Limited: Less than 10% of planning area Significant: 10-50% of planning area Extensive: 50-100% of planning area</p> <p>Probability of Future Occurrences Highly Likely: Near 100% chance of occurrence in next year or happens every year. Likely: Between 10 and 100% chance of occurrence in next year or has a recurrence interval of 10 years or less. Occasional: Between 1 and 10% chance of occurrence in the next year or has a recurrence interval of 11 to 100 years. Unlikely: Less than 1% chance of occurrence in next 100 years or has a recurrence interval of greater than every 100 years.</p>	<p>Magnitude/Severity (Extent) Catastrophic—More than 50 percent of property severely damaged; shutdown of facilities for more than 30 days; and/or multiple deaths Critical—25-50 percent of property severely damaged; shutdown of facilities for at least two weeks; and/or injuries and/or illnesses result in permanent disability Limited—10-25 percent of property severely damaged; shutdown of facilities for more than a week; and/or injuries/illnesses treatable do not result in permanent disability Negligible—Less than 10 percent of property severely damaged, shutdown of facilities and services for less than 24 hours; and/or injuries/illnesses treatable with first aid</p> <p>Significance Low: minimal potential impact Medium: moderate potential impact High: widespread potential impact</p>
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Other Hazards Considered

Other hazards were noted by the HMPC and public to potentially consider in the HMP update. Some of these hazards have the potential to do damage or harm but since the focus of this plan is on natural hazards, per the DMA requirements, they are not profiled further; in some cases they are currently addressed in other planning mechanisms or have had limited historic impacts:

- Expansive Soils
- Radon
- Tree mortality/hazardous trees in developed areas
- Human-Wildlife conflicts
- Energy Shortage
- Civil Disturbance/Disorder
- Terrorism
- Cyber Threat
- Transportation Incidents/emergencies
- Well Stimulation & Hydraulic Fracturing

5.1.2 Disaster Declaration History

One method the HMPC used to identify hazards was researching past events that triggered federal and state emergency or disaster declarations in the planning area. Federal and state disaster declarations may be granted when the severity and magnitude of an event surpasses the ability of the local government to respond and recover. Disaster assistance is supplemental and sequential. When the local government's capacity has been surpassed, a state disaster declaration may be issued, allowing for the provision of state assistance. Should the disaster be so severe that both the local and state governments' capacities are exceeded, a federal emergency or disaster declaration may be issued allowing for the provision of federal assistance. In other words, a presidential disaster declaration puts federal recovery programs in place to help disaster victims, business, and public agencies.

The federal government may issue a disaster declaration through FEMA, the U.S. Department of Agriculture (USDA), or the Small Business Administration (SBA). FEMA also issues emergency declarations, which are more limited in scope and without the long-term federal recovery programs of major disaster declarations (Farm Service Agency 2018). The quantity and types of damage are the determining factors. This section focuses on state and federal disaster and emergency declarations.

The communities throughout San Luis Obispo are among the many in California that are susceptible to disaster. Details on federal and state disaster declarations were obtained by the HMPC, FEMA, and the California Office of Emergency Services (Cal OES) and compiled in chronological order in Table 5-3. A review of state and federal declared disasters indicates that San Luis Obispo County received 26 state proclamations between 1950 and March 2017, 22 of which also received federal disaster declarations. Of the 26 state declarations, 19 were associated with flooding (13 of the flooding events which were related to severe winter storms and heavy rains; 1 was associated with coastal flooding; and 3 were flooding and mudslides); 3 were for drought (not including declaration issued by the USDA); 2 were for freeze; ; 1 was for earthquake; and 2 were for wildfire.

Since 2012, there have been 13 drought declarations issued by the Secretary of Agriculture in San Luis Obispo County, 9 of which were Fast Track Secretarial disaster designations. According to the Secretary of Agriculture, a Fast Track designation is for a severe drought and provides an automatic designation when during the growing season any portion of the county meets the severe drought intensity value for eight consecutive weeks. Refer to the Drought hazard profile for more information of Disaster Declarations from the Secretary of Agriculture related to drought events.

This disaster history (combined federal and state) suggests that San Luis Obispo County experiences a major event worthy of a disaster declaration every 2.6 years. The County has a 39 percent chance of receiving a disaster declaration in any given year. With the exception of the declarations for earthquake and wildfire, every declaration resulted directly or indirectly from severe weather. Similarly, most disaster-related injuries to people and damage to property and crops resulted from severe weather. Further, a review of these events helps San Luis Obispo County and its jurisdictions identify risk reduction targets and ways to improve capabilities to avoid large-scale hazard events in the future.

Table 5-3 San Luis Obispo County's State and Federal Disaster Declarations, 1950-2018

Hazard Type	Disaster #	Year	State Proclamation	Federal Declaration	Location	Damage*
Floods	OCD 50-01	1950	11/21/50	--	Statewide	9 deaths; \$32,183,000
Floods	DR-28	1955	12/22/55	12/23/55	Statewide	74 deaths; \$200,000,000
Severe Storms – Flood	--	1958	4/2/58	4/4/58	Statewide	13 deaths; several injuries \$24,000,000
Severe Storms – Flood	--	1963	2/14/164	--	Northern California – Boundaries of SLO county and 3 other counties up to the Oregon Border	--
Severe Winter Storms – Flood	DR-223	1967	12/1/1966	1/2/1967	San Luis Obispo (and 7 other counties)	\$28,761,041
Flood	DR-253	1969	--	1/26/1969	San Joaquin County (and 39 other counties)	47 deaths; 161 injuries \$300,000,000



Hazard Type	Disaster #	Year	State Proclamation	Federal Declaration	Location	Damage*
Offshore Oil Platform Spill	--	1969	--	--	Coastal Areas of Southern California	--
Severe Winter Storms – Coastal Flooding	DR-364	1973	1/30/1973	2/8/1973	San Luis Obispo County (and 5 other counties)	\$17,998,250
Drought	--	1976	2/9/76, 2/13/76, 2/24/76, 3/26/76, 7/6/76	--	San Luis Obispo County (and 30 other counties)	\$2,664,000,000
Drought	EM-3023	1977	--	1/20/1977	San Luis Obispo County	--
Severe Winter Storms- Flood	DR-547	1978	2/1/1978	2/15/1978	San Luis Obispo County (and 13 other counties)	14 deaths, 21 injuries, \$117,802,785
Severe Winter Storms- Flood	DR-677	1982 - 1983	12/8/1982- 3/21/1982	2/9/1983	San Luis Obispo County (and 43 other counties)	\$523,617,032
Wildfire – Las Pilitas Fire	DR-739	1985	7/1/1985	7/18/1985	San Luis Obispo County (and 6 other counties)	3 deaths, 470 injuries, \$64,845,864 Burned 75,000 acres from Las Pilitas area to SLO. Portions of the City of SLO was evacuated.
Train Derailment	--	1986	--	--	Grover Beach	Evacuations, Road closures
Freeze	USDA and SBA declaration	1987	-	-	San Luis Obispo	-
Drought		1988	1/1/1988- 12/31/1988	-	Statewide	-
Drought	USDA	1990	1/1990- 7/13/1990	-	-	-
Extreme Cold Weather/ Freeze	DR-894	1990	12/19/1990- 1/18/1991	2/11/1991	San Luis Obispo County (32 other counties)	\$856,329,675



Hazard Type	Disaster #	Year	State Proclamation	Federal Declaration	Location	Damage*
Hwy 41 Fire	GP 94-02	1994	8/24/1994	--	San Luis Obispo County	12 injuries, \$6,382,235 Burned 48,531 acres, 42 homes, and 61 other structures
Severe Winter Storms - Flood	DR-1044	1995	1/6/95- 3/14/96	1/13/1995	San Luis Obispo County (and 42 other counties)	11 deaths, \$221,948,347
Severe Winter Storms - Flood	DR-1046	1995	Proclaimed	1/10/1995	San Luis Obispo County (all counties except Del Norte)	17 deaths, \$132,040,111
Highway 58 Fire	Local Proclamation of Emergency	1996	-	-	San Luis Obispo	Burned 106,668 acres
Highway 166/Logan Fire	-	1997	-	-	San Luis Obispo	Burned 50,000 acres
Severe Winter Storm- Flood	DR-1155	1997	1/2/1997- 1/31/1997	1/4/1997	San Luis Obispo County (and 47 other counties)	8 deaths, \$194,352,509
Severe Winter Storms- Flood	DR-1203	1998	Proclaimed	2/9/1998	San Luis Obispo County (42 other counties)	17 deaths, \$385,141,192
Severe Storms- Flood	DC 2001-01	2001	3/1/2001	-	San Luis Obispo County (and 2 counties)	\$2,248,000 estimated in damages throughout county. Arroyo Grande levee breached on south side.
Earthquake - San Simeon Earthquake	DR-1505	2003	12/23/2003	1/13/2004	San Luis Obispo County (and Santa Barbara County)	2 deaths estimated \$239,000,000 in damages, response and recovery costs
Parkfield Earthquake	-	-	9/2004	-	San Luis Obispo	Minor damages
Hurricane Katrina - Economic	EM-3248	2005	--	9/13/2005	Statewide	\$763,576
Winter Storms - Flood	DR-1628	2005 - 2006	--	2/3/2006	San Luis Obispo County (and 29 counties + statewide HM)	1 death; \$203,050,747



Hazard Type	Disaster #	Year	State Proclamation	Federal Declaration	Location	Damage*
Freeze	DR-1689	2007	--	3/13/2007	San Luis Obispo County (and 12 other counties)	\$2,700,400
Winter Storms - Flood	DR-1952	2010 - 2011	12/1/2010	1/26/20/11	San Luis Obispo County (and 12 counties)	Most severe damages in areas of South County, particularly Oceano area. \$66,318,201
Tsunami	DR-1968	2011	3/11/2011	4/18/2011	Statewide	-
Freezing Temperature, High Winds, Excessive Rain	S3255	2012	3/1/2012 - 4/30/2012 (begin to end date)	6/9/2012 (Sec. Ag Approval date)	San Luis Obispo County	--
Hail Storm, Rain, cold temperatures	S3320	2012	4/11/2012- 4/13/2012 (begin to end dates)	8/3/2012 (Sec. of Ag approval date)	San Luis Obispo County	--
Drought	Local Emergency	2014 - 2017	--	--	San Luis Obispo County	
Drought		2014	January 17, 2014 – April 7, 2017	--	Statewide	--
Intense Thunderstorms	-	2015	-	-	Paso Robles	3.6" of rain in 8 hours, causing water and mud damage to 20-30 homes
Cuesta Fire	-	2015	-	-	Santa Margarita	A portion of the community of Santa Margarita was evacuated
Rain and Wind	S4003	2016	4/8/2016 – 5/6/2016 (begin to end dates)	7/27/2016 (Sec. of Ag. approval date)	San Luis Obispo County	--



Hazard Type	Disaster #	Year	State Proclamation	Federal Declaration	Location	Damage*
Severe Weather including excessive rainfall and high winds	S4164	2016	3/3/2016-6/1/2016 (begin to end dates)	3/31/2017 (Sec. of Ag approval date)	San Luis Obispo County	--
Excessive rain, high winds, cold temperatures, and hail	S4170	2016	3/1/2016-5/7/2016 (begin to end dates)	4/28/2017 (Sec. of Ag approval date)	San Luis Obispo County	--
Chimney Fire	FM-5146	2016	8/15/2016	-	Nacimiento Lake area	46,344 acres burned, 49 residential type structures destroyed, 21 other structures destroyed, 8 damaged. Hearst Castle was closed for some time.
Severe Storms- Flooding and Mudslides	DR-4301	2017	-	2/14/2017	San Luis Obispo County (and 33 other counties)	\$39,956,354
Severe Storms - Flooding and Mudslides	DR-4305	2017	2/10/2017	3/16/2017	San Luis Obispo County (and 21 other counties)	\$14,320,716
Severe Storms - Flooding and Mudslides	DR-4308, GP 2017-03	2017	3/7/2017	4/1/2017	San Luis Obispo County (and 41 counties and 1 tribe)	8 deaths; \$119,834,925 (DR) \$331,137 (GP)
Freeze	S4350	2018	2/20/2018	7/18/2018 (Sec. of Ag approval date)	San Luis Obispo County	--

Source: 2018 California State Hazard Mitigation Plan, FEMA, USDA

*Damage amount, deaths and injuries reflect totals for all impacted counties

5.1.3 Climate Change Considerations Summary

The County acknowledges that climate change is occurring and has begun to plan for it as seen by the EnergyWise Plan and ClimateWise Integrated Climate Change Adaptation Planning in San Luis Obispo County report. County climate change projections include:



- An increase in temperature between 2.1 and 3.9 degrees by 2045 and between 4.1 and 7.6 degrees by 2085
- Annual average precipitation decreases up to 4.2 inches or increase up to 1.5 inches by 2045 and decrease by 4.73 inches or increase by .88 inches by 2085
- 3.3 to 4.6 feet in sea level rise by 2100
- Increase in area of the county burned by wildfire from 3.7% to 6.8-7.3% by 2045 and to 8.1-8.5% by 2085.
- Negative impacts on wildlife due to reduced water supply, rising sea levels, and an increase in wildfire and flooding events
- Negative impacts on agricultural productivity due to higher temperatures, decrease in water supply and shifts in seasonal changes
- Deteriorating public health due to decrease in water supplies and increase risk of wildfire, which have detrimental effects on air quality
- Decreased supply of fresh water due to higher temperatures and continued population growth
- Increased severity of flood events based on climate model projections that predict less frequent rainfall events, but with greater severity

The important consideration for hazard mitigation is that climate change is exacerbating the hazards which are already identified and profiled. For example, it can be expected that coastal storm surge will become more of a threat as sea level rises. Additional specifics associated with the hazards are discussed in the Climate Change Considerations portion of each hazard profile.

5.1.4 Overview of Hazard Identification and Risk Assessment

Subsection 5.3 contains detailed hazard profiles for the identified hazards. Each hazard profiled includes the following subsections:

- **Hazard/Problem Definition**—This section gives a description of the hazard and associated issues followed by details on the hazard specific to the San Luis Obispo County planning area.
- **Geographic Area** – This section gives a spatial description of the potential location or areas of San Luis Obispo County where the hazard expected to impact.
- **Extent (Magnitude/Severity)**– This section gives a description of the potential strength or magnitude of the hazard as it pertains to San Luis Obispo County.
- **Previous Occurrences**—This section contains information on historical incidents, including impacts where known. Historical incident worksheets were used to capture information from participating jurisdictions on past occurrences.
- **Probability of Future Occurrence**—The frequency of past events is used in this section to gauge the likelihood of future occurrences. Where possible, frequency was calculated based on existing data. It was determined by dividing the number of events observed by the number of years on record and multiplying by 100. This gives the percent chance of an event happening in any given year (e.g., three droughts over a 30-year period equates to a 10 percent chance of a drought in any given year). The likelihood of future occurrences is categorized into one of the following classifications:
 - **Highly Likely** — Near 100 percent chance of occurrence in next year or happens every year.
 - **Likely** — Between 10 and 100 percent chance of occurrence in next year or has a recurrence interval of 10 years or less.

- **Occasional** — Between 1 and 10 percent chance of occurrence in the next year or has a recurrence interval of 11 to 100 years.
- **Unlikely** — Less than 1 percent chance of occurrence in next 100 years or has a recurrence interval of greater than every 100 years.
- **Climate Change Considerations** - This describes the potential for climate change to affect the frequency and intensity of the hazard in the future
- **Vulnerability** - Following the hazard profiles is a vulnerability assessment for each identified hazard. The assessment was conducted through the study of potential impacts to the following specific sectors:
 - General Property
 - People
 - Critical Facilities and Infrastructure
 - Economy
 - Historic, Cultural, and Natural Resources
 - Future Development
 - Risk Summary - Each vulnerability assessment includes a risk summary of the key issues/problems based on threat, vulnerability and consequence to the planning area and jurisdictions from the specific hazard.

Data used to support this assessment included the following:

- County GIS data (hazards, base layers, and assessor's data);
- Statewide GIS datasets to support mitigation planning;
- State of California Hazard Mitigation Plan 2018;
- San Luis Obispo County Hazard Mitigation 2014;
- Jurisdictional Hazard Mitigation Plans;
- Cal FIRE datasets;
- California's Fourth Climate Change Assessment: Central Coast Region Report;
- US Forest Service GIS datasets;
- FEMA's HAZUS-MH GIS-based critical facility inventory data;
- Written descriptions of inventory and risks provided by the jurisdictions;
- Online data sources (cited where applicable);
- Data and information from existing plans and studies; and
- Input from planning team members and staff from the County and local, state, and federal agencies.

5.2 Asset Summary

5.2.1 Assets Exposure

As a starting point for analyzing the Planning Area's vulnerability to identified hazards, the HMPC used a variety of data to define a baseline against which all disaster impacts could be compared. If a catastrophic disaster was to occur in the Planning Area, this section describes significant assets exposed or at risk in the Planning Area. Data used in this baseline assessment included:

- Total assets at risk;
- Critical facility inventory;
- Cultural, historical, and natural resources; and

- Population growth and land use/development trends.

Total Assets at Risk

Parcel data was provided by ParcelQuest, a third-party service working alongside the San Luis Obispo County Assessor's Office to compile property information. This data provided the baseline for an inventory of the total exposure of developed properties within the county and helps to ensure that the updated HMP reflects changes in development. It is important to note that depending on the nature and type of hazard event or disaster, it is generally the value of the infrastructure or improvements to the parcels that are of concern or at risk. Generally, the land itself is not a total loss, but may see a reduction in value. Thus, the parcel analysis excludes land value.

Parcel Exposure and Preparations for Analysis

Building counts and valuations in this plan are based on data from the County Assessor's Office as well as ParcelQuest. The ParcelQuest GIS layer contains the assessor's information, and for the purpose of parcel analysis and exposure calculations only parcels with improved values were used, except for exempt or government properties (which by definition do not include an improvement value and is one limitation that results in the total improvement values underestimating the actual value). "Improved" parcels have an improvement value greater than zero. Contents values were also estimated, as a percentage of building value based on their property type, using FEMA/HAZUS guidelines. Content value estimates are based on 100% of the structure value for commercial and agriculture structures, 150% of the structure value for industrial structures, and finally 50% for residential structures. Improvement values were added to contents values to arrive at the total structure values for all properties in the parcel layer. The parcel layer, originally in the form of polygons, was then converted into points based on the center (or centroid) of a parcel to approximate building locations. Table 5-4, Table 5-5, and Table 5-6 below summarize the count and value of improved properties, contents, and total values for the property inventory grouped by jurisdiction, as well as exposure values by property type, and finally the exposure values by property type for the unincorporated areas of the County.

Table 5-4 San Luis Obispo County Total Exposure by Jurisdiction

Jurisdiction	Property Count	Improved Value	Content Value	Total Value
Arroyo Grande	6,693	\$1,608,652,049	\$865,870,064	\$2,474,522,113
Atascadero	10,298	\$2,311,286,428	\$1,223,381,289	\$3,534,667,717
City of San Luis Obispo	14,083	\$4,412,540,270	\$2,664,377,282	\$7,076,917,552
Grover Beach	4,713	\$866,176,076	\$462,306,623	\$1,328,482,699
Morro Bay	5,320	\$1,113,527,653	\$579,407,494	\$1,692,935,147
Paso Robles	10,714	\$2,821,913,364	\$1,632,765,187	\$4,454,678,551
Pismo Beach	4,885	\$1,439,073,785	\$761,589,312	\$2,200,663,097
Unincorporated	46,878	\$12,207,641,760	\$6,261,161,189	\$18,468,802,949
TOTAL	103,584	\$26,780,811,385	\$14,450,858,440	\$41,231,669,825

Source: Wood analysis based on ParcelQuest and San Luis Obispo County Assessor's Office data 2019



Table 5-5 San Luis Obispo County Total Exposure by Property Type

Property Type	Property Count	Improved Value	Content Value	Total Value
Agricultural	623	\$503,096,233	\$503,096,233	\$1,006,192,466
Commercial	3,972	\$2,382,146,177	\$2,382,146,177	\$4,764,292,354
Government/Utilities	2,704	\$10,842,823	--	\$10,842,823
Other/Exempt/Misc.	3,701	\$695,078,084	--	\$695,078,084
Residential	73,954	\$18,260,098,270	\$9,130,049,135	\$27,390,147,405
Multi-Family Residential	9,116	\$2,265,198,982	\$1,132,599,491	\$3,397,798,473
Mobile/Manufactured Homes	3,748	\$494,287,198	\$247,143,599	\$741,430,797
Residential: Other	3,414	\$1,331,071,111	\$665,535,556	\$1,996,606,667
Industrial	266	\$260,192,166	\$390,288,249	\$650,480,415
Vacant	2,086	\$578,800,341	--	\$578,800,341
TOTAL	103,584	\$26,780,811,385	\$14,450,858,440	\$41,231,669,825

Source: Wood analysis based on ParcelQuest and San Luis Obispo County Assessor's Office data 2019

Table 5-6 Total Exposure by Property Type in Unincorporated San Luis Obispo County

Location	Property Type	Property Count	Improved Value	Content Value	Total Value
Unincorporated	Agricultural	592	\$455,950,949	\$455,950,949	\$911,901,898
	Commercial	799	\$382,693,827	\$382,693,827	\$765,387,654
	Government/Utilities	1,932	\$7,465,764	--	\$7,465,764
	Other/Exempt/Misc.	1,904	\$234,552,034	--	\$234,552,034
	Residential	34,081	\$9,553,005,276	\$4,776,502,638	\$14,329,507,914
	Multi-Family Residential	1,890	\$409,203,080	\$204,601,540	\$613,804,620
	Mobile/Manufactured Homes	3,067	\$377,655,433	\$188,827,717	\$566,483,150
	Residential: Other	807	\$280,364,775	\$140,182,388	\$420,547,163
	Industrial	85	\$74,934,754	\$112,402,131	\$187,336,885
	Vacant	1,721	\$431,815,868	--	\$431,815,868
	TOTAL	46,878	\$12,207,641,760	\$6,261,161,189	\$18,468,802,949

Source: Wood analysis based on ParcelQuest and San Luis Obispo County Assessor's Office data 2019

Critical Facility Inventory

For the purposes of this plan, a critical facility is defined as one that is essential in providing utility or direction either during the response to an emergency or during the recovery operation. The County of San Luis Obispo uses the following four categories to describe critical assets:

- **Emergency Services** – Facilities or centers aimed at providing for the health and welfare of the whole population (e.g., hospitals, police, fire stations, emergency operations centers, evacuation shelters, schools).
- **Lifeline Utility Systems** – Facilities and structures such as potable water treatment plants, wastewater, oil, natural gas, electric power and communications systems.
- **Transportation Systems** – These include railways, highways, waterways, airways and city streets to enable effective movement of services, goods and people.
- **High Potential Loss Facilities** – These include nuclear power plants, dams, and levees.



The specific critical facilities analyzed in this plan are provided in Table 5-7 and Table 5-8 and displayed in Figure 5-1. A general summary of the critical facilities based on their categories just described is provided in Table 5-7 below. A portion of the critical facilities data was provided by the San Luis Obispo County Planning & Building and GIS Departments; supplemental data from the Homeland Infrastructure Foundation-Level Data (HIFLD) was used to capture additional facilities such as law enforcement facilities and centers, communications facilities, emergency operations centers, schools, and urgent care facilities among others. The specific facilities that were provided by the County or its departments came from five data layers: airports, power plants, water/wastewater treatment plants, California energy commission substations, and fire facilities. The other types or additional facilities were obtained at the federal level from the HIFLD dataset. Furthermore, participating jurisdictions identified additional or supplemental assets on a data collection guide worksheet or in previous LHMPs which may capture more facilities and additional details not within the main critical facility GIS database. For a list of assets and vulnerabilities within specific jurisdictions, please refer to the jurisdictional annexes and Appendix E. Vulnerabilities of specific facilities to specific hazards were analyzed with a GIS overlay analysis where data permitted. The results are discussed within each hazard's vulnerability section in subsection 5.3 and detailed in Appendix E.

Table 5-7 Critical Facilities Types by Category

Emergency Services	Lifeline Utility Systems	Transportation Systems	High Potential Loss Facilities
Colleges / Universities	AM Transmission Towers	Airports	Power Plants
Day Care Facilities	Broadband Radio Service & Educational Broadband Service Transmitters		
Emergency Medical Service Stations	Energy Commission Facilities		
Fire Stations	Cellular Towers		
Hospitals	Electric Substations		
Local Law Enforcement	FM Transmission Towers		
Nursing Homes	Microwave Service Towers		
Private Schools	Paging Transmission Towers		
Public Schools	TV Analog Station Transmitters		
Supplemental Colleges	TV Digital Transmitters		
Urgent Care	Water Treatment Facilities		
Veterans Affairs Medical Facilities	Wastewater Treatment Plants		

Source: San Luis Obispo County Planning & Building/GIS; HIFLD.



Figure 5-1 Critical Facilities in San Luis Obispo County

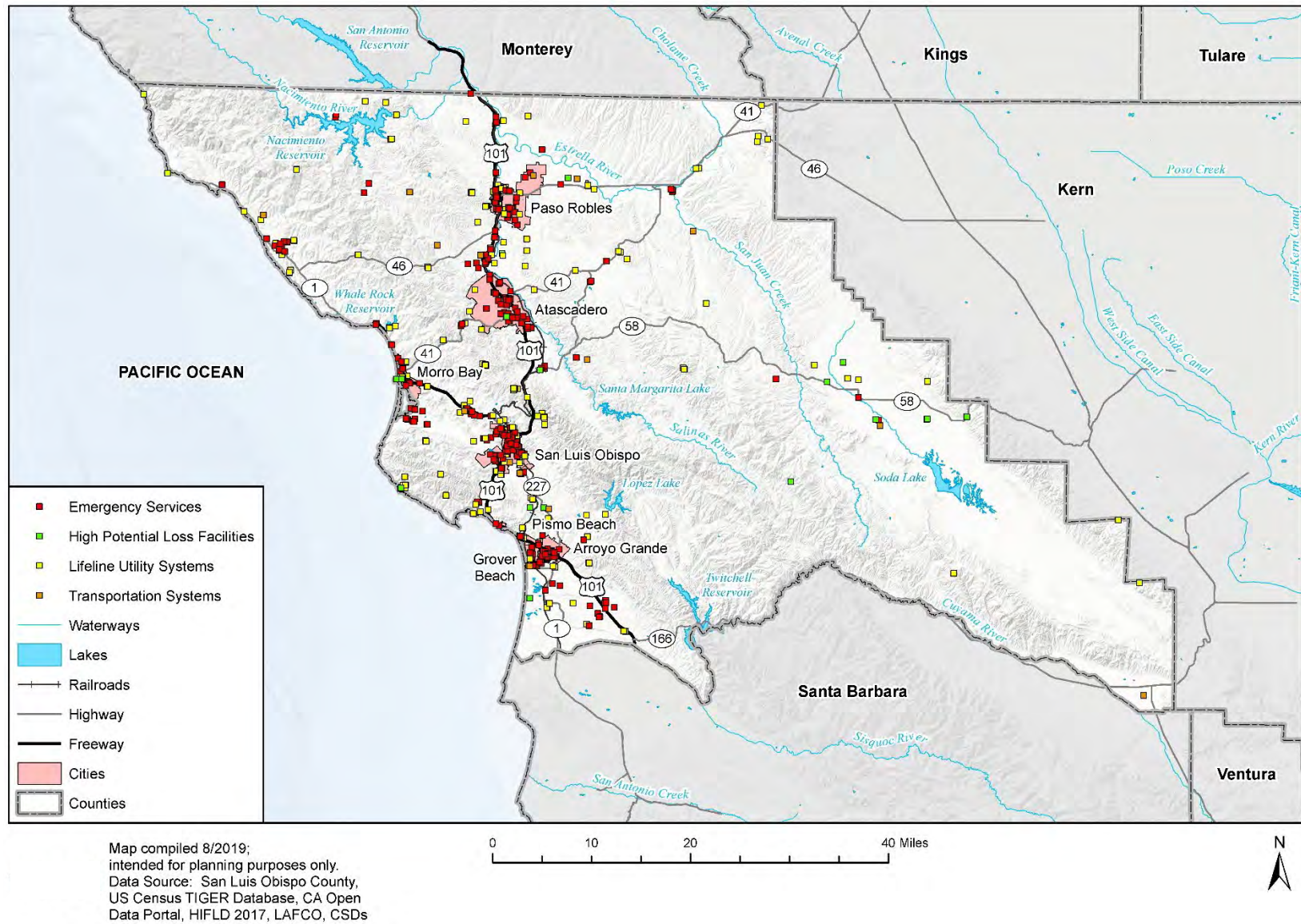


Table 5-8 Summary of Critical Facilities in San Luis Obispo County by Jurisdiction

Jurisdiction	Category	Critical Facility Type	Count
Arroyo Grande	Emergency Services	Day Care Facilities	8
		Emergency Medical Service Stations	2
		Fire Stations	1
		Hospitals	2
		Local Law Enforcement	1
		Nursing Homes	2
		Private Schools	4
		Public Schools	5
		Urgent Care	1
	High Potential Loss Facilities	Power Plants	1
	Lifeline Utility Systems	FM Transmission Towers	1
		Paging Transmission Towers	1
Energy Commission Facilities		3	
Transportation Systems	Airports	1	
Total			33
Atascadero	Emergency Services	Day Care Facilities	13
		Emergency Medical Service Stations	2
		Fire Stations	3
		Hospitals	1
		Local Law Enforcement	1
		Nursing Homes	8
		Private Schools	2
		Public Schools	9
		Supplemental Colleges	1
		Urgent Care	1
	High Potential Loss Facilities	Power Plants	2
	Lifeline Utility Systems	Microwave Service Towers	2
		TV Analog Station Transmitters	1
Energy Commission Facilities		1	
Total			47
Grover Beach	Emergency Services	Day Care Facilities	2
		Emergency Medical Service Stations	1
		Fire Stations	1
		Local Law Enforcement	1
		Private Schools	1
		Public Schools	3
	Lifeline Utility Systems	Microwave Service Towers	2
		Water Treatment Facilities	1
Total			12
Morro Bay	Emergency Services	Day Care Facilities	4
		Emergency Medical Service Stations	2
		Fire Stations	2
		Local Law Enforcement	1
		Nursing Homes	2
		Public Schools	2
	High Potential Loss Facilities	Power Plants	1
	Lifeline Utility Systems	Microwave Service Towers	5
		Wastewater Treatment Plants	1
		Energy Commission Facilities	2
Total			22
Paso Robles	Emergency Services	Colleges / Universities	1
		Day Care Facilities	14
		Emergency Medical Service Stations	1



Jurisdiction	Category	Critical Facility Type	Count
		Fire Stations	3
		Local Law Enforcement	1
		Nursing Homes	2
		Private Schools	3
		Public Schools	12
		Supplemental Colleges	1
		Urgent Care	1
	High Potential Loss Facilities	Power Plants	1
	Lifeline Utility Systems	AM Transmission Towers	1
		FM Transmission Towers	1
		Microwave Service Towers	12
		Water Treatment Facilities	1
		Energy Commission Facilities	2
	Transportation Systems	Airports	1
Total			58
Pismo Beach	Emergency Services	Day Care Facilities	2
		Emergency Medical Service Stations	2
		Fire Stations	3
		Local Law Enforcement	1
		Public Schools	2
		Urgent Care	1
	Lifeline Utility Systems	Microwave Service Towers	6
		Wastewater Treatment Plants	1
	Transportation Systems	Airports	1
Total			19
San Luis Obispo	Emergency Services	Colleges / Universities	2
		Day Care Facilities	18
		Emergency Medical Service Stations	5
		Fire Stations	4
		Hospitals	3
		Local Law Enforcement	2
		Nursing Homes	3
		Private Schools	5
		Public Schools	12
		Urgent Care	1
		Veterans Affairs Medical Facilities	1
	Lifeline Utility Systems	AM Transmission Towers	1
		FM Transmission Towers	1
		Microwave Service Towers	52
		Wastewater Treatment Plants	1
		Energy Commission Facilities	7
	Transportation Systems	Airports	2
Total			120
Unincorporated	Emergency Services	Colleges / Universities	2
		Day Care Facilities	29
		Emergency Medical Service Stations	25
		Fire Stations	29
		Hospitals	1
		Local Law Enforcement	8
		Nursing Homes	5
		Private Schools	4
		Public Schools	40
	High Potential Loss Facilities	Power Plants	7
	Lifeline Utility Systems	AM Transmission Towers	5



Jurisdiction	Category	Critical Facility Type	Count
		Broadband Radio Service & Educational Broadband Service Transmitters	5
		Cellular Towers	19
		Electric Substations	2
		FM Transmission Towers	33
		Microwave Service Towers	368
		Paging Transmission Towers	6
		TV Analog Station Transmitters	15
		TV Digital Transmitters	4
		Wastewater Treatment Plants	5
		Water Treatment Facilities	7
		Energy Commission Facilities	8
	Transportation Systems	Airports	10
Total			637
Grand Total			948

Source: San Luis Obispo County Planning & Building/GIS, Community Service Districts, HIFLD

Cultural, Historical, and Natural Resources

Assessing the County of San Luis Obispo's vulnerability to disaster also involves inventorying the natural, historical, and cultural assets of the area. This step is important for the following reasons:

- The community may decide that these types of resources warrant a greater degree of protection due to their unique and irreplaceable nature and contribution to the overall economy.
- In the event of a disaster, an accurate inventory of natural, historical and cultural resources allows for more prudent care in the disaster's immediate aftermath when the potential for additional impacts is higher.
- The rules for reconstruction, restoration, rehabilitation, and/or replacement are often different for these types of designated resources.
- Natural resources can have beneficial functions that reduce the impacts of natural hazards, for example, wetlands and riparian habitat which help absorb and attenuate floodwaters and thus support overall mitigation objectives.

Cultural Resources

Historical resources are buildings, structures, objects, places, and areas that are eligible for listing in the National Register of Historic Places (NRHP), the California Register of Historic Resources (CRHR), or the County's List of Historic Resources, have an association with important persons, events in history, or cultural heritage, or have distinctive design or construction method.

San Luis Obispo County has a wealth of historic and prehistoric resources, including sites and buildings associated with Native Americans, Spanish missionaries, immigrant settlers, and military branches of the United States. Native American groups have occupied the County dating back at least 10,000 years, including the Chumash, Salinan, and Yokut tribes. In 1595, the Spanish sailed into San Luis Obispo Bay, near the large Obispeño village of Sepjato, which thereafter greatly changed the aboriginal way of life. In 1769 Gaspar de Portolà and Father Junipero Serra passed through present day San Luis Obispo County with the objective to secure the port and establish missions along his route, and the Mission San Luis Obispo de Tolosa was founded near San Luis Obispo Creek. In 1822, California became a Mexican Territory, and the mission lands gradually became private ranchos via Mexican land grants. After the



decline of the mission era in the late 1830s, San Luis Obispo County gradually grew from a remote outpost into a thriving agricultural and commercial region with an influx of Euro-American land holders settling in the area.

For purpose of federal actions, a qualified historic resource is defined as a property listed in or formally determined eligible for listing in the NRHP before a disaster occurs. The NRHP is part of a national program to coordinate and support public and private efforts to identify, evaluate, and protect historic and archeological resources. Properties listed include districts, sites, buildings, structures, and objects that are significant in American history, architecture, archeology, engineering, and culture. The National Register is administered by the U.S. Department of the Interior National Park Service. Local and state agencies may consider a broader definition of qualified historic properties in the review, evaluation, and treatment of properties damaged during a disaster.

The State of California Office of Historic Preservation can provide technical rehabilitation and preservation services for historic properties affected by a natural disaster. Depending on the hazard, protection could range from emergency preparedness, developing a fire safe zone around sites susceptible to wildfires, or seismically strengthening or structurally reinforcing structures.

State and local registers of historic resources provide designated Historical Landmarks, Points of Historical Interest, and Historic Buildings. These resources include, but are not limited to:

- The California Register of Historical Resources
- The California Historical Landmarks
- The California Inventory of Historical Resources
- The California Points of Historical Interest
- The City of San Luis Obispo Cultural Heritage Committee
- The History Center of San Luis Obispo has created an inventory of the Historic Buildings of San Luis Obispo County.

County Historical Resources may be designated on a federal, state, or local level. Local historical resources may be within the jurisdictions of an Area Plan. Historical resources designated under a regional or local plan are provided in Table 5-9. Vulnerabilities of specific historic buildings to specific hazards were analyzed with a GIS overlay analysis where data permitted. The results are discussed within each hazard's vulnerability section in subsection 5.3.

Table 5-9 San Luis Obispo County Historical Resources and Area Plans

Historical Resource	Year	Area Plan
Rotta Winery	1856	Adelaida Area Plan
Adelaida Cemetery	1891	Adelaida Area Plan
York Mountain Winery	1882	Adelaida Area Plan
San Marcos Cemetery	1889	Adelaida Area Plan
Willow Creek Cemetery	1911	Adelaida Area Plan
Estrella Adobe Church	1878	El Pomar-Estrella Area Plan
Creston Cemetery	--	El Pomar-Estrella Area Plan
Pozo Saloon	1865	Las Pilitas Area Plan

Historical Resource	Year	Area Plan
Santa Margarita de Cortona	1775	Salinas River Area Plan
Mission San Miguel Archangel	1797	Salinas River Area Plan
Bethel Lutheran Church	1887	Salinas River Area Plan
Banning School	1896	San Luis Obispo Area Plan
Hansen Barn	--	San Luis Obispo Area Plan
Independence School	--	San Luis Obispo Area Plan
Octagon Barn	1900	San Luis Obispo Area Plan
Vasquez-Hollister Adobe	1800	San Luis Obispo Area Plan
Dana Adobe	1839	South County Inland Area Plan
Dana House	1882	South County Inland Area Plan
Pacific Coast Railroad Depot	1881	South County Inland Area Plan
Old St. Joseph's Church	1902	South County Inland Area Plan
Runels Home - Dana Street	1886	South County Inland Area Plan
Hearst Castle	1919	North Coast Area Plan
Van Gordon Archaeological Site	--	North Coast Area Plan
Bianchini House	1889	North Coast Area Plan
The Paul Squibb House	1877	North Coast Area Plan
Port San Luis Lighthouse	1890	San Luis Bay Coastal Area Plan
Huasna School	1907	Huasna-Lopez Area Plan
Adelaida School	1917	Adelaida Area Plan
J.F. MacGillivray Residence	1879	Adelaida Area Plan
Geneseo School	1886	El Pomar-Estrella Area Plan
Creston Community Church	1886	El Pomar-Estrella Area Plan
Rancho Huasna Sparks Adobe	1850	Huasna-Lopez Area Plan
Tar Springs Ranch	--	Huasna-Lopez Area Plan
Porter Ranch House	1890	Huasna-Lopez Area Plan
C.H. Phillips House	1886	Salinas River Area Plan
Rios Caledonia Adobe	1830	Salinas River Area Plan
Marre House	1932	San Luis Bay Area Plan-Inland
Tognazzini General Store	1908	San Luis Obispo Area Plan
Los Osos School House	1872	Estero Area Plan
Captain James Cass House	1872	Estero Area Plan
Los Berros Schoolhouse	1890	South County Inland Area Plan



Historical Resource	Year	Area Plan
The Sebastian Store	1860	North Coast Area Plan
Canet Adobe	1840	Estero Area Plan
Lyman House	1895	San Luis Obispo Area Plan
Rinconada School	1880	El Pomar-Estrella Area Plan
Chandler House (Webster)	1882	El Pomar-Estrella Area Plan
Linne School	1891	El Pomar-Estrella Area Plan
Los Berros Adobe Barn	1860	South County Inland Area Plan
Hearst Ranch Headquarters	--	North Coast Area Plan
Eight-Mile House	1877	Salinas
	--	San Luis Bay Area Plan-Inland
Avila Valley Historic Site 2	--	San Luis Bay Area Plan-Inland
Avila Valley Historic Site 1	--	San Luis Bay Area Plan-Inland
Temple of The People, Halcyon	1903	San Luis Bay Area Plan-Inland
Price Adobe	--	San Luis Bay Area Plan-Inland
Captain James Cass House & Adjacent Buildings	1872	Estero Area Plan
Cayucos Pier	--	Estero Area Plan
Spooner Residence	--	Estero Area Plan
The Bluebird Motel	--	North Coast Area Plan
Carroll's Blacksmith Shop	--	North Coast Area Plan
Heart's Ease	--	North Coast Area Plan
Ian's Restaurant	--	North Coast Area Plan
Robin's Restaurant	--	North Coast Area Plan
The Squibb House	--	North Coast Area Plan
The Brambles Restaurant	--	North Coast Area Plan
Rigdon Hall Restaurant	--	North Coast Area Plan
The Red House	--	North Coast Area Plan
The Bianchini House	--	North Coast Area Plan
The Bucket of Blood Saloon	--	North Coast Area Plan
Louis Maggetti's House	--	North Coast Area Plan
Camozzi's	--	North Coast Area Plan
Soto's Market	--	North Coast Area Plan
The Leffingwell House	--	North Coast Area Plan
The Olallieberry Inn	--	North Coast Area Plan



Historical Resource	Year	Area Plan
The Lull House	--	North Coast Area Plan
The Old Santa Rosa Chapel	--	North Coast Area Plan
The Thorndyke House	--	North Coast Area Plan
The First Presbyterian Church	--	North Coast Area Plan
The Bank of Cambria	--	North Coast Area Plan
Arthur Beale House	1928	North Coast Area Plan
Ah Louis Store	1874	San Luis Obispo Area Plan
Admin/Veterans memorial bldg	1918	Salinas River Area Plan
Coffee T. Rice House	1886	San Luis Bay Area Plan-Coastal
Dallidet Adobe	1859	San Luis Obispo Area Plan
Morro Rock	1769	Estero Area Plan
Mission SLO De Tolosa	1772	San Luis Obispo Area Plan
Ortega-Price Adobes	1840	San Luis Bay Area Plan-Inland
Santa Margarita Asistencia	1775	Salinas River Area Plan

Source: County of San Luis Obispo Office of Planning and Building

Lists of designated historical resources change periodically, and they may not include those currently in the nomination process and not yet listed. Additionally, as defined by the National Environmental Policy Act (NEPA), any property over 50 years of age is considered a historic resource and is potentially eligible for the National Register. Thus, in the event that the property is to be altered, or has been altered, as the result of a major federal action, the property must be evaluated under the guidelines set forth by NEPA. Structural mitigation projects are considered alterations for the purpose of this regulation.

Cultural resources defined in California Environmental Quality Act (CEQA) Section 15064.5 as include prehistoric and historic archaeological resources; historic-period resources (buildings, structures, area, place, or objects). Archaeological resources reflect past human activity extending from Native American prehistoric cultures throughout the early 20th century. The artifacts left by previous occupants may be encountered in small to large residential sites, or special use areas.

Many cultural and historical resources in the County are vulnerable to several hazards due to location and the nature of their construction. Some of these risks include earthquakes, wildfires, coastal storms, or adverse weather.

Tribal Cultural Resources

Tribal cultural resources are defined in Public Resources Code (PRC) Section 21074.1 as a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe. A Native American tribe is defined as "a federally recognized California Native American tribe or a non-federally recognized California Native American tribe that is on the contact list maintained by the Native American Heritage Commission". Traditional tribal cultural places are defined in PRC Sections 5097.9 and 5097.993 to include



sanctified cemeteries, places of worship, religious or ceremonial sites, or sacred shrines, or any historic, cultural, or sacred site that is listed on or eligible for the CRHR including any historic or prehistoric ruins, burial grounds, or archaeological site. Cultural and tribal resources are governed primarily by federal, state, and local laws that regulate potential impacts to such resources. State regulations that were established to encourage the preservation and protection of traditional tribal cultural resources include:

- **Assembly Bill 52** (Public Resources Code [PRC] Section 21080.3.1): mandates early tribal consultation prior to and during CEQA review to consider tribal cultural values in determination of project impacts and mitigation.
- **Senate Bill 18** (Government Code 655352.3): requires cities and counties to consult with Native American tribes early during broad land use planning efforts on both public and private lands, prior to site- and project-specific land use decisions. Consultation is intended to encourage preservation and protection of traditional tribal cultural places by developing treatment and management plans that might include incorporating the cultural places into designated open spaces.
- **State Executive Order B-10-11 (2011)** established the Governor's Tribal Advisor position and established Administration Policy to encourage State Agencies to communicate and consult with Californian tribes regarding tribal cultural resources.

Natural Resources

Natural resources issues of the County include those regarding: geology, soils, hydrology, plant and wildlife ecology, resources laws, and natural resource public policy (County of San Luis Obispo 2019a). San Luis Obispo County is diverse in natural resources, exemplified by its creeks and rivers that drain inland mountains in confluence with the Pacific Ocean, coastal dunes and cliffs, oak woodlands, extensive mountainous landscapes, and grasslands in the Carrizo Plain National Monument. Interfaces of urban areas and natural landscapes provide accessible walking and hiking trails with sweeping views of the peaks and valleys of the county's mountain ranges, and the Pacific Ocean. Natural resources within the county includes several managed areas and protected habitats, including the State Marine Conservation Areas (SMCA), State Marine Reserves (SMR), State Marine Recreational Management Area (SMRMA), state parks and beaches, and state game refuges. These areas support ecologically significant habitats where endangered or threatened species occur, including designated critical habitat and nesting and foraging sites for migratory bird species.

Natural resources are important to include in benefit/cost analyses for future projects and may be used to leverage additional funding for mitigation projects that also contribute to community goals for protecting sensitive natural resources. Inventory and awareness of natural resource assets is vital to meeting conservation objectives. For example, protecting wetland areas provides sensitive habitat protection as well as floodwater conveyance and storage, which further enhances public safety. Natural resource maps can be found in the Planning & Building section of the County of San Luis Obispo web site (County of San Luis Obispo 2019b).

Natural resources also exhibit varied levels of resiliency to anthropogenic impacts, climate change, and natural hazards such as flooding, drought, coastal storms or wildfire. Climate change is one of the most substantial threats to conserving the biodiversity and ecological habitat of the County (OPR 2019). Habitat resiliency is exemplified in coastal habitat migration to inland areas as a result to sea level rise, and

recovery of burn areas following a wildfire. For example, grassland vegetation burned by wildfire typically regrows and recovers within five or so years.

Natural and Beneficial Functions

Natural and beneficial functions of a region can describe hydrologically significant, environmentally sensitive, and ecologically productive areas that perform many natural functions. Floodplains can have natural and beneficial functions including water storage and conveyance, protection of water quality, and recharge of groundwater (Walton County 2018). Wetlands function as natural sponges that trap and slowly release surface water, rain, snowmelt, groundwater and flood waters. Trees, root mats, and other wetland vegetation also slow the speed of floodwaters and distribute them more slowly over the floodplain. This combined water storage and braking action lowers flood heights and reduces erosion. Wetlands within and downstream of urban areas are particularly valuable, counteracting the greatly increased rate and volume of surface water runoff from pavement and buildings. The holding capacity of wetlands helps control floods and can help limit impacts to agricultural as well as urban areas. Preserving and restoring wetlands, together with other water retention, can often provide the level of flood control otherwise provided by expensive dredge operations and levees.

Natural resources provide scenic value and are vital to recreation in the County. Recreational functions provided by natural resources include parks and campgrounds, water-oriented sports and activities such as boating, swimming, and hiking. Wildlife resources in floodplains can be managed for observation, and recreational hunting and fishing, as coastal floodplains are recognized for their importance to estuarine and marine fisheries. Coastal beaches, dunes, banks, and tidal flats all play roles in protecting landward structures from destructive coastal storms and erosion. Other beneficial functions of County natural resources include diverse habitats for aquatic and terrestrial species, as well as natural crops and timber.

Special Status Species

To further understand natural resources that may be particularly vulnerable to a hazard event, as well as those that need consideration when implementing mitigation activities, it is important to identify at-risk species (endangered and threatened species) in the Planning Area. The US Fish and Wildlife Service maintains a list of federally-listed threatened and endangered species for the country, which can be queried at the state or even county levels. The California Department of Fish and Wildlife also maintains species lists and accounts for threatened and endangered species. State and federal laws protect the habitat of these species through the environmental review process. Species of special concern may additionally include species that meets the State definition of threatened or endangered but has not been formally listed, experiences seriously population declines or habitat decline, or has naturally small populations exhibiting high susceptibility to population decline (Department of Fish and Wildlife 2019).

Table 5-10 summarizes San Luis Obispo County's special status animal species as indicated in the Fish and Wildlife Service database, within the Environmental Conservation Online System.

Table 5-10 Threatened and Endangered Species in San Luis Obispo County

Common Name	Scientific Name	Group	Federal Status	State Status
Arroyo (=arroyo southwestern) toad	<i>Anaxyrus californicus</i>	Amphibians	Endangered	None
Bank swallow	<i>Riparia</i>	Birds	None	Threatened
Bald eagle	<i>Haliaeetus leucocephalus</i>	Birds	None	Endangered
Blunt-nosed leopard lizard	<i>Gambelia silus</i>	Reptiles	Endangered	Endangered
Beach spectaclepod	<i>Dithyrea maritima</i>	Flowering Plants	None	Threatened
Buena Vista Lake ornate shrew	<i>Sorex ornatus relictus</i>	Mammals	Endangered	None
California black rail	<i>Laterallus jamaicensis coturniculus</i>	Birds	None	Threatened
California ridgway's rail	<i>Rallus obsoletus</i>	Birds	Endangered	Endangered
California condor	<i>Gymnogyps californianus</i>	Birds	Endangered	Endangered
California jewelflower	<i>Caulanthus californicus</i>	Flowering Plants	Endangered	Endangered
California least tern	<i>Sterna antillarum browni</i>	Birds	Endangered	Endangered
California red-legged frog	<i>Rana draytonii</i>	Amphibians	Threatened	None
California seablite	<i>Suaeda californica</i>	Flowering Plants	Endangered	None
California tiger salamander	<i>Ambystoma californiense</i>	Amphibians	Threatened	Threatened
Camatta canyon amole	<i>Chlorogalum purpureum var. reductum</i>	Flowering Plants	Threatened	Rare
Chorro Creek bog thistle	<i>Cirsium fontinale var. obispoense</i>	Flowering Plants	Endangered	Endangered
Conservancy fairy shrimp	<i>Branchinecta conservatio</i>	Crustaceans	Endangered	None
Delta smelt	<i>Hypomesus transpacificus</i>	Fishes	Threatened	Endangered
El Segundo blue butterfly	<i>Euphilotes battoides allyni</i>	Insects	Endangered	None
Gambel's watercress	<i>Rorippa gambellii</i>	Flowering Plants	Endangered	Threatened
Gaviota Tarplant	<i>Deinandra increscens ssp. villosa</i>	Flowering Plants	Endangered	Endangered
Giant garter snake	<i>Thamnophis gigas</i>	Reptiles	Threatened	Threatened
Giant kangaroo rat	<i>Dipodomys ingens</i>	Mammals	Endangered	Endangered
Hearst's manzanita	<i>Arctostaphylos hookeri ssp. hearstiorum</i>	Flowering Plants	None	Endangered
Indian Knob mountainbalm	<i>Eriodictyon altissimum</i>	Flowering Plants	Endangered	Endangered
Kern mallow	<i>Eremalche kernensis</i>	Flowering Plants	Endangered	None
Kern primrose sphinx moth	<i>Euproserpinus euterpe</i>	Insects	Threatened	None
La Graciosa thistle	<i>Cirsium loncholepis</i>	Flowering Plants	Endangered	Threatened
Least Bell's vireo	<i>Vireo bellii pusillus</i>	Birds	Endangered	Endangered
Leatherback sea turtle	<i>Dermochelys coriacea</i>	Reptiles	Endangered	None
Longhorn fairy shrimp	<i>Branchinecta longiantenna</i>	Crustaceans	Endangered	None
Marbled murrelet	<i>Brachyramphus marmoratus</i>	Birds	Threatened	Endangered
Marsh Sandwort	<i>Arenaria paludicola</i>	Flowering Plants	Endangered	Endangered
Monterey spineflower	<i>Chorizanthe pungens var. pungens</i>	Flowering Plants	Threatened	None
Morro Bay kangaroo rat	<i>Dipodomys heermanni morroensis</i>	Mammals	Endangered	Endangered
Morro manzanita	<i>Arctostaphylos morroensis</i>	Flowering Plants	Threatened	None



Common Name	Scientific Name	Group	Federal Status	State Status
Morro shoulderband (=Banded dune) snail	<i>Helminthoglypta walkeriana</i>	Snails	Endangered	None
Nelson's antelope ground squirrel	<i>Ammospermophilus nelsoni</i>	Mammals	None	Threatened
Nipomo Mesa lupine	<i>Lupinus nipomensis</i>	Flowering Plants	Endangered	Endangered
Olive ridley sea turtle	<i>Lepidochelys olivacea</i>	Reptiles	Threatened	None
Pismo clarkia	<i>Clarkia speciosa ssp. immaculata</i>	Flowering Plants	Endangered	None
Purple amole	<i>Chlorogalum purpureum var. purpureum</i>	Flowering Plants	Threatened	None
Salt marsh bird's-beak	<i>Cordylanthus maritimus ssp. maritimus</i>	Flowering Plants	Endangered	Endangered
San Luis Obispo fountain thistle	<i>Cirsium fontinale var. obispoense</i>	Flowering Plants	None	Endangered
San Joaquin kit fox	<i>Vulpes macrotis mutica</i>	Mammals	Endangered	Threatened
San Joaquin wooly-threads	<i>Monolopia (=Lembertia) congdonii</i>	Flowering Plants	Endangered	None
Smith's blue butterfly	<i>Euphilotes enoptes smithi</i>	Insects	Endangered	None
Southern sea otter	<i>Enhydra lutris nereis</i>	Mammals	Threatened	None
Southwestern willow flycatcher	<i>Empidonax traillii extimus</i>	Birds	Endangered	Endangered
Steelhead - south-central California coast DPS	<i>Oncorhynchus mykiss irideus pop. 9</i>	Fishes	Threatened	None
Steelhead - southern California coast DPS	<i>Oncorhynchus mykiss irideus pop. 10</i>	Fishes	Endangered	None
Surf thistle	<i>Cirsium rothophilum</i>	Flowering Plants	None	Threatened
Spreading navarretia	<i>Navarretia fossalis</i>	Flowering Plants	Threatened	None
Swainson's hawk	<i>Buteo swainsoni</i>	Birds	None	Threatened
Tidewater goby	<i>Eucyclogobius newberryi</i>	Fishes	Endangered	None
Tipton kangaroo rat	<i>Dipodomys nitratoideus</i>	Mammals	Endangered	Endangered
Vernal pool fairy shrimp	<i>Branchinecta lynchi</i>	Crustaceans	Threatened	None
Western snowy plover	<i>Charadrius nivosus</i>	Birds	Threatened	None
Yellow-billed Cuckoo	<i>Coccyzus americanus</i>	Birds	Threatened	Endangered

Source: US Fish and Wildlife Service – Environmental Conservation Online System, 2019

Population, Growth and Development Trends

The County has a population of approximately 280,119 people, with a wide range of income levels and demographics (US Census Bureau 2017). Over 85% of the County identifies as white, including 22% of Hispanics. The Countywide median household income in 2017 was estimated to be \$67,175 and median family income was estimated at \$83,084. Additionally, US Census Bureau data estimates that 13.8% of the population is below the federal poverty level and that at least 37.1% of the County's population is considered low-income relative to State Income Limits. Critical demographic information includes: 4.6% of the civilian labor force over 16 years old is unemployed; 81.5% of the population age 25 and older has at least a high school degree, with 34.1% having a bachelor's degree or higher (United States Census Bureau 2017); and 40.3% of occupied housing units are renter occupied (U. S. Census Bureau 2010).



Populations in San Luis Obispo County that may face disproportionate risks include the elderly, those already affected by diseases, outdoor and migrant workers, people living in coastal and inland floodplains, those living at the wildland-urban interface, the student population, institutionalized individuals (especially the state hospital), and non-English speaking individuals. Social vulnerability data and considerations are described in subsection 4.4.1 and further noted in each hazard's Vulnerability: People section in subsection 5.3.

As part of the planning process, the HMPC analyzed changes in growth and development, both past and future, and examined these changes in the context of hazard-prone areas, and how the changes in growth and development affect loss estimates and vulnerability.

Table 5-11 illustrates the moderate pace of population growth in the County of San Luis Obispo dating back to 2000 and population trends for each incorporated jurisdiction in the county.

Table 5-11 Population Growth for the County of San Luis Obispo from 2000-2017

Municipality	2000	2010	2017	Population Growth 2000-2017
Arroyo Grande	15,851	17,252	17,971	13%
Atascadero	26,409	28,310	29,797	13%
Grover Beach	13,067	13,156	13,524	3%
Morro Bay	10,350	10,234	10,568	2%
Paso Robles	24,284	29,793	31,409	29%
Pismo Beach	8,551	7,655	8,060	-6%
City of San Luis Obispo	44,174	45,119	46,997	6%
Countywide	246,681	269,637	280,119	14%

Source: US Census Bureau American FactFinder, 2019

Future Population Growth

The California Department of Transportation (Cal Trans) recently published population growth predictions for the County of San Luis Obispo (Cal Trans, 2018). The report forecasts economic and employment development using historical evidence from 2012 to 2017 and includes several predictions from 2018 to 2050. According to this report, which seeks to describe the local socioeconomic profile of the county, San Luis Obispo is expected to continue to grow at a slow rate, averaging 0.4% per year between 2018 and 2023. The majority of the growth will be from migration entering the county. This summary states that, by 2050, the total population could be 298,795.

Development Trends

In order to assess where development is expected to take place (or has recently taken place) across the county with regards to hazards, new construction permits and entitlements for residential and commercial properties were obtained, in spatial format, since the last update of this plan (2014 through early 2019). These permits were then mapped as points and color-coded based on the year in which they were submitted. Figure 5-2 displays the centroids that were generated from each permit polygon, mapped by year of submittal to the Office of Planning & Building at the County, while Table 5-12 summarizes the total building construction permits by year, case type, and work class. The data indicates a dispersal pattern of development trends with some clusters along the Highway 101 corridor, notably between Paso Robles and Atascadero and south of Arroyo Grande.

To further associate these building construction permits with natural hazards in the county and be able to narrow down potential vulnerable areas to this expected development (hence assessing risk to future construction of commercial and residential buildings), a spatial overlay analysis was performed that intersected the centroid points and the hazard layers. With this overlay analysis, summaries similar to those conducted for parcel and critical facility analyses could be delivered. These assessments are discussed in more detail in each of the hazard sections, under the Development Trends sections.



Figure 5-2 Building Construction Permits in San Luis Obispo County from 2014 to Early 2019

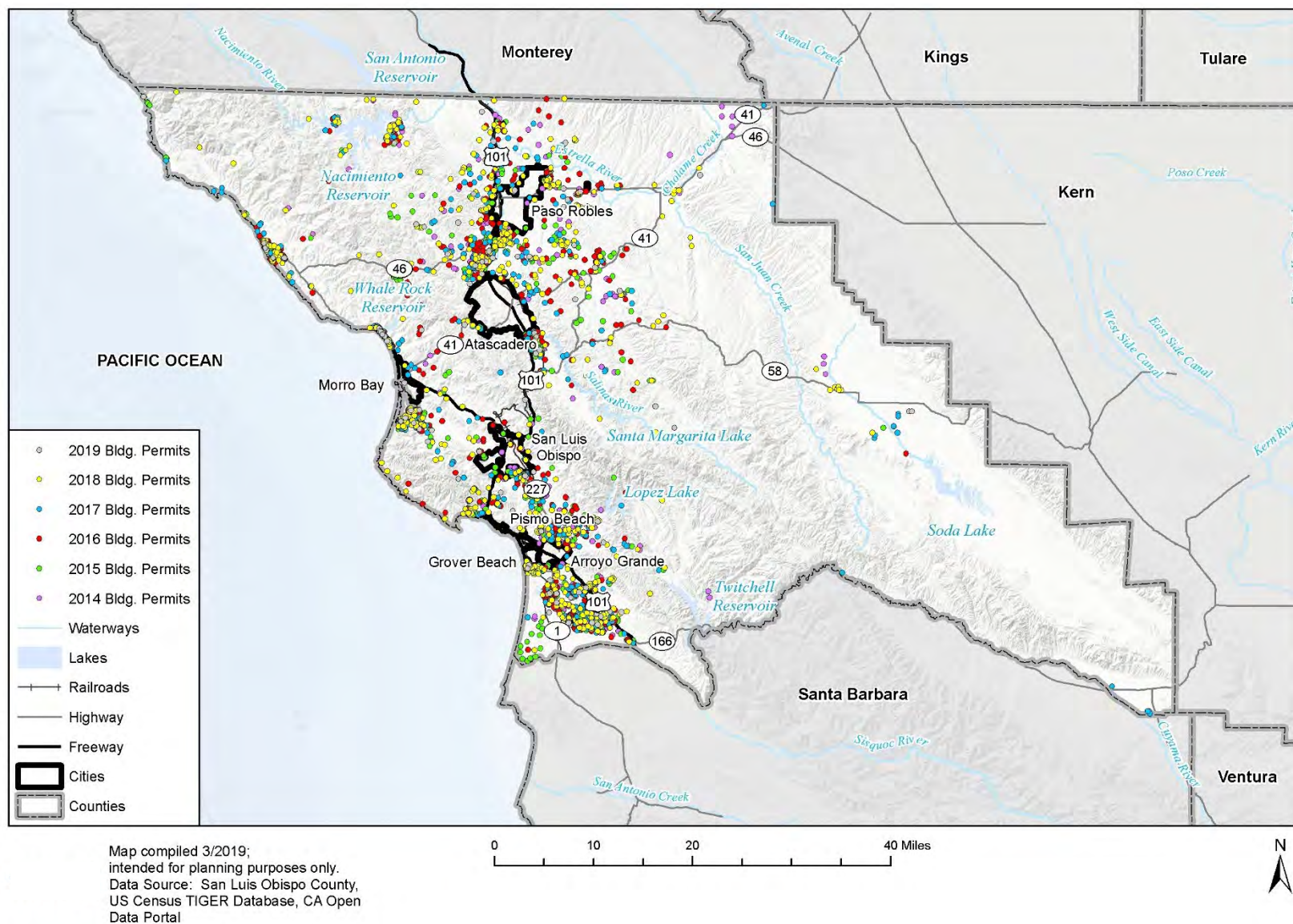


Table 5-12 Total Building Construction Permits by Case Type and Work Class

Year	Case Type	Work Class	Count
2014	Land Use	Conditional Use Permit	29
		Minor Use Permit	130
	PMTC - Commercial Permit	New Structure	223
	PMTR - Residential Permit		560
	TOTAL		942
2015	Land Use	Conditional Use Permit	167
		Minor Use Permit	128
	PMTC - Commercial Permit	New Structure	180
	PMTR - Residential Permit		514
	TOTAL		989
2016	Land Use	Conditional Use Permit	36
		Minor Use Permit	117
	PMTC - Commercial Permit	New Structure	151
	PMTR - Residential Permit		819
	TOTAL		1,123
2017	Land Use	Conditional Use Permit	26
		Minor Use Permit	146
	PMTC - Commercial Permit	New Structure	186
	PMTR - Residential Permit		483
	TOTAL		841
2018	Land Use	Conditional Use Permit	78
		Minor Use Permit	133
	PMTC - Commercial Permit	New Structure	155
	PMTR - Residential Permit		602
	TOTAL		968
2019 (up to Feb)	Land Use	Conditional Use Permit	4
		Minor Use Permit	21
	PMTC - Commercial Permit	New Structure	30
	PMTR - Residential Permit		85
	TOTAL		140
GRAND TOTAL			5,003

Source: San Luis Obispo County Planning & Building



5.3 Hazard Analysis and Risk Assessment

5.3.1 Adverse Weather: General

Adverse weather is generally any destructive weather event, but usually occurs in the San Luis Obispo County as localized thunderstorms that bring heavy rain and strong winds that occur most often during the winter and spring months.

For this plan, adverse weather is broken down as follows:

- Thunderstorm/Heavy Rain/Hail/Lighting/Dense Fog/Freeze
- High Wind/Tornado
- Extreme Heat

The proximity to the Pacific Ocean both moderates and exaggerates certain types of adverse weather. Winter storms impacting coastal portions of the County tend to be more extreme than in the inland portions. The ocean's influence is also a significant factor in moderating extreme hot and cold temperatures, hail storms and other cold weather events. These events are rare and short lived, causing little if any life-threatening situations and only occasional significant damage to property or agricultural concerns.

The HMPC determined that extreme heat should also be profiled and analyzed within adverse weather for this 2019 Plan Update. Extreme heat events are projected to increase throughout the state which will have impacts on people's health, as well as indirect impacts effects such as increased vulnerability and risk to wildfires and drought.

The National Oceanic and Atmospheric Administration's National Center for Environmental Information (NCEI) has been tracking adverse weather since 1950. Their Storm Events Database contains data on the following: all weather events from 1993 to 2017 (except from 6/1993-7/1993); and additional data from the Storm Prediction Center, which includes tornadoes (1950-1992), thunderstorm winds (1955-1992), and hail (1955-1992). This database contains 115 storm events that occurred in San Luis Obispo County between January 1, 1950, and December 31, 2018. The table below summarizes these events.

Table 5-13 NCEI Hazard Event Reports for San Luis Obispo County, 1950-2018*

Type	# of Events	Property Loss (\$)	Crop Loss (\$)	Deaths	Injuries
Excessive Heat/Heat	3	0	0	0	0
Flash Floods	5	0	0	0	0
Floods	10	0	0	0	0
Frost/Freeze	2	0	30,400,000	0	0
Hail	4	0	0	0	0
Heavy Rain	9	5,000,000	0	1	0
High Winds/Thunderstorm Winds	27	4,050,000	0	0	0
Tornado/Funnel Cloud	39	\$0	0	3	5
High Surf	4	0	0	0	0
Waterspout	2	0	0	0	0
Wildfire	4	290,000	0	0	0
Winter Weather/Winter Storm	6	0	0	1	2
Totals	115	9,340,000	30,400,000	5	7

Source: National Center for Environmental Information Storm Events Database, www.ncdc.noaa.gov/stormevents/

*Hazards with wide extents have losses which reflect larger zones that extend beyond San Luis Obispo County

The NCEI table above summarizes adverse weather events that have occurred in San Luis Obispo County from 1950 to 2018. Only a few of the events actually resulted in state and federal disaster declarations. It is interesting to note that different data sources capture different events during the same time period, and often different information specific to the same events. While the HMPC recognizes these inconsistencies, this data provides value in depicting the County's "big picture" hazard environment.

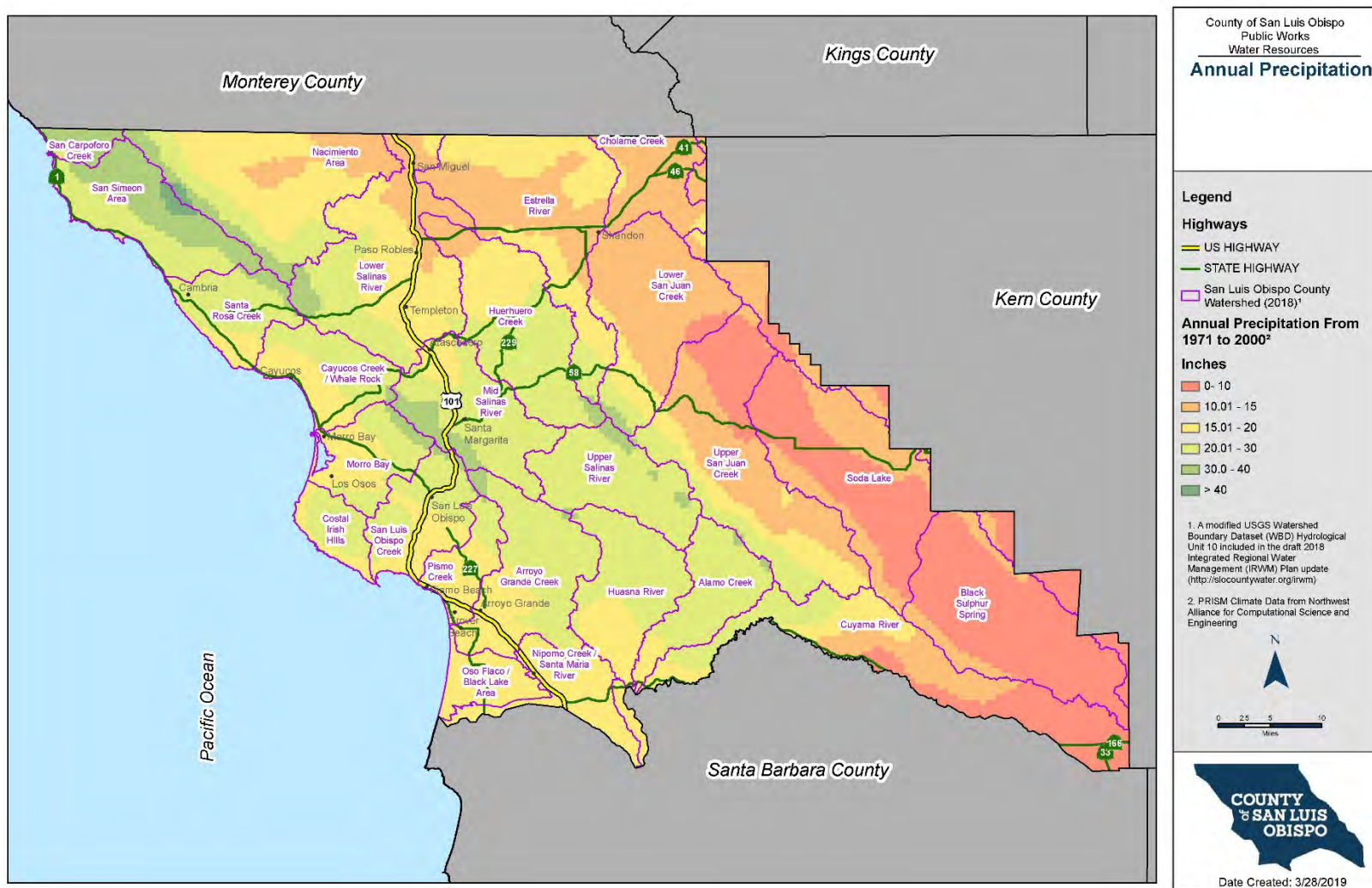
As previously mentioned, a majority of San Luis Obispo County's state and federal disaster declarations have been a result of severe winter weather.

The climate of the county is influenced by the effects of the Santa Lucia Range and the Pacific Ocean. The northern portion of the county where the mountains end at the ocean experience heavier rainfall amounts compared to the southern portion of the county. Figure 5-3 below, depicts the average annual precipitation in the county and shows how precipitation differs throughout. Note, the purple lines and text on the map represent the County's Watershed Groups that are included in the 2018 Integrated Regional Water Management Plan update.

Due to the size of the county and changes in elevation and climate, weather conditions can vary greatly. The National Weather Service provides forecasts for three zones within the county: central coast, interior valley, and mountains and the County Public Works Department has stream and rain gauges in four areas of the county; North County Coastal Area, North County Inland Area, City of San Luis Obispo Area, and South County Area.

To give a holistic picture of the various weather conditions the hazard profiles that follow provide information, where possible, from four weather stations: San Luis Obispo Poly Tech (San Luis Obispo Area, elevation: 330 feet), Morro Bay Fire Department (North County Coastal Area, elevation: 115 feet), Paso Robles (North County Inland Area, elevation: 700 feet) and Pismo Beach (South County Area, elevation: 39 feet).

Figure 5-3 San Luis Obispo County Annual Precipitation, 1971-2000



Source: County of San Luis Obispo Public Works Department, Water Resources

5.3.2 Adverse Weather: Thunderstorm/Heavy Rain/Dense Fog/Freeze

Hazard/Problem Definition

A majority of adverse weather experienced in San Luis Obispo takes place in the winter months as heavy rain and thunderstorm events sometimes accompanied by high winds, dense fog, hail and freeze events. High winds and tornado events are profiled in 5.3.3. Approximately 10 percent of the thunderstorms that occur each year in the United States are classified as severe. A thunderstorm is classified as severe when it contains one or more of the following phenomena: hail that is three-quarters of an inch or greater, winds in excess of 50 knots (57.5 mph), or a tornado.

San Luis Obispo's weather is influenced by the Pacific Ocean and routine climate patterns such as El Niño. El Niño is the warm phase of the El Niño-Southern Oscillation, a pattern found in the tropical Pacific when there are fluctuations in temperatures between the ocean and atmosphere. During El Niño, the surface winds across the entire tropical Pacific are weaker than normal and the ocean surface is at above-average temperatures in the central and eastern tropical Pacific Ocean (L'Heureux 2014). El Niño typically develops over North America during the winter season causing the severe winter storms the County often experiences. This climate pattern occurs every few years and brings with it above-average rain and snow across the southern region of United States, especially in California.

Atmospheric rivers, another climate pattern that leads to adverse weather in the County, are responsible for up to 50 percent of California's precipitation annually and 65 percent seasonally (Arcuni, 2019). An atmospheric river (AR) is a long, narrow region of the atmosphere, like a river in the sky, that transports most of the water vapor outside of the tropics. ARs can be 300 miles wide, a mile deep and more than 1,000 miles long and carry an amount of water vapor roughly the same as the average flow of water at the mouth of Mississippi River (NOAA, 2015). Warm water storms over the Pacific Ocean lead to evaporation and create a high concentration of moisture in the air. While prevailing winds create the distinctive river shape, which is often compared "to a fire hose pointed at California" (Arcuni, 2019). When an atmospheric river reaches land, it releases the water vapor in the form of rain or snow. Atmospheric rivers play an important role in the global water cycle and are closely tied to both water supply and flooding risk.

Research suggests that atmospheric rivers contributed to the collapse of both Orville Dam spillways in February 2017 (NASA Global Hydrology Resource Center), as well as the winter flooding in 1861-1862, which completely inundated Sacramento and is considered the worst flood event in California's history (Ingram, 2013). When an atmospheric river forms in the tropical regions of the Pacific near Hawaii it is known as a "Pineapple Express". This type of atmospheric river can produce as much as five inches in one day (NOAA, 2018). In 2018 two Pineapple Express ARs hit California causing significant heavy precipitation events throughout state.

Hail is formed when water droplets freeze and thaw as they are thrown high into the upper atmosphere by the violent internal forces of thunderstorms. Hail is sometimes associated with severe storms within the San Luis Obispo County planning area. Hailstones are usually less than two inches in diameter and can fall at speeds of 120 miles per hour (mph). Severe hailstorms can be quite destructive, causing damage to roofs, buildings, automobiles, vegetation, and crops.

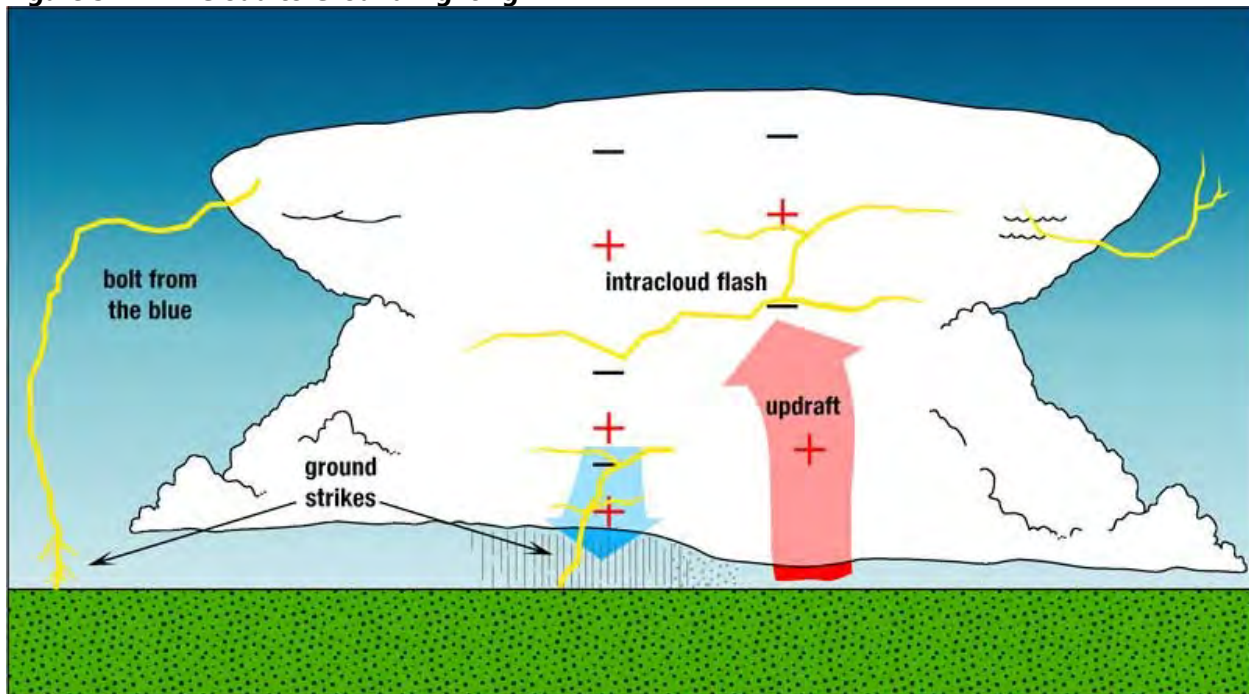
Lightning is defined as any and all of the various forms of visible electrical discharge caused by thunderstorms. Thunderstorms and lightning are usually (but not always) accompanied by rain. Severe

lightning events in San Luis Obispo County are rare, although they do take place occasionally. Refer to the Previous Occurrences section below for the narrative on a 2019 adverse weather event.

Intra-cloud lightning is the most common type of discharge. This occurs between oppositely charged centers within the same cloud. Usually it takes place inside the cloud and looks from the outside of the cloud like a diffuse brightening that flickers. However, the flash may exit the boundary of the cloud, and a bright channel, similar to a cloud-to-ground flash, can be visible for many miles.

Cloud-to-ground lightning is the most damaging and dangerous type of lightning, though it is also less common. Most flashes originate near the lower-negative charge center and deliver negative charge to earth. However, a large minority of flashes carry positive charge to earth. These positive flashes often occur during the dissipating stage of a thunderstorm's life. Positive flashes are also more common as a percentage of total ground strikes during the winter months. This type of lightning is particularly dangerous for several reasons. It frequently strikes away from the rain core, either ahead or behind the thunderstorm. It can strike as far as 5 or 10 miles from the storm in areas that most people do not consider to be a threat (see Figure 5-4). Positive lightning also has a longer duration, so fires are more easily ignited. And, when positive lightning strikes, it usually carries a high peak electrical current, potentially resulting in greater damage.

Figure 5-4 Cloud to Ground Lightning



Source: National Weather Service Pueblo Office

San Luis Obispo's climate is described as a mild Mediterranean climate; a freeze refers to a particularly cold spell of weather where the temperature drops below 32 degrees, most typically in the early morning hours. Usually these cold spells will last only two or three days when the ocean influence will overcome the cold front and the early morning temperatures will return to the normal 45 to 55-degree range. Rainfall during these periods may result in snowfall in the higher elevations of the county.

Dense fog in San Luis Obispo County reduces visibility making driving more dangerous. A fog advisory issued for San Luis Obispo County in October 2011 warned visibility could be as low as a quarter mile and reduce suddenly with denser patches. In March 2012 another fog advisory anticipated less than ¼ of normal visibility. The National Weather Service issues dense fog advisories when appropriate and suggests slowing down on the road, using headlights at all times, and leaving plenty of distance from other vehicles.

Geographic Area

Thunderstorms are generally expansive in size. The entire county is susceptible to any of the effects of a severe thunderstorm, including hail and heavy rain. As noted at the beginning of the Adverse Weather profile, the proximity to the Pacific Ocean and the mountain ranges in the county both moderate and exaggerate certain types of adverse weather depending on where the storm event has occurred.

Extent (Magnitude/Severity)

Extent for adverse weather, particularly severe storms that involve heavy rain and hail can be measured according to hail by diameter sizes. The National Weather Service (NWS) classifies hail by diameter size, and corresponding everyday objects to help relay scope and severity to the population. Table 5- 2 below indicates the hailstone measurements utilized by the NWS.

There is no clear distinction between storms that do and do not produce hailstones. Nearly all severe thunderstorms probably produce hail aloft, though it may melt before reaching the ground. Multi-cell thunderstorms produce many hailstones, but not usually the largest hailstones. In the life cycle of the multi-cell thunderstorm, the mature stage is relatively short so there is not much time for growth of the hailstone. Supercell thunderstorms have sustained updrafts that support large hail formation by repeatedly lifting the hailstones into the very cold air at the top of the thunderstorm cloud. In general, hail 2 inches (5 cm) or larger in diameter is associated with supercells (a little larger than golf ball size which the NWS considers to be 1.75 inch.). Non-supercell storms are capable of producing golf ball size hail.

Common problems associated with severe storms include the loss of utilities or immobility. Loss of life is uncommon but can occur during severe storms. Immobility can occur when roads become impassable due to dense fog, heavy rains causing flooding, downed trees, or a landslide. Fog specifically poses a risk to commuters and driving conditions as fog typically forms rapidly in the early morning hours. Fog can have devastating effects on transportation corridors in the county. Nighttime driving in the fog is dangerous and multi-car pileups have resulted from drivers using excessive speed for the conditions and visibility. Loss of utilities, specifically power lines can occur due to downed trees, high winds and heavy snows. While snow accumulation is unlikely within the San Luis Obispo planning area, high winds and downed trees are known to result in power outages.

Table 5-14 Hail Measurements

Average Diameter	Corresponding Household Object
.25 inch	Pea
.5 inch	Marble/Mothball
.75 inch	Dime/Penny
.875 inch	Nickel
1.0 inch	Quarter
1.5 inch	Ping-pong ball
1.75 inch	Golf-Ball
2.0 inch	Hen Egg
2.5 inch	Tennis Ball
2.75 inch	Baseball
3.00 inch	Teacup
4.00 inch	Grapefruit
4.5 inch	Softball

Source: National Weather Service

Lightning is measured by the Lightning Activity Level (LAL) scale, created by the National Weather Service to define lightning activity into a specific categorical scale. The LAL is a common parameter that is part of fire weather forecasts nationwide. The San Luis Obispo County is at risk to experience lightning in any of these categories. The LAL is reproduced in Table 5-15.

Table 5-15 Lightning Activity Level Scale

Lightning Activity Level	
LAL 1	No thunderstorms
LAL 2	Isolated thunderstorms. Light rain will occasionally reach the ground. Lightning is very infrequent, 1 to 5 cloud to ground strikes in a five-minute period
LAL 3	Widely scattered thunderstorms. Light to moderate rain will reach the ground. Lightning is infrequent, 6 to 10 cloud to ground strikes in a five-minute period.
LAL 4	Scattered thunderstorms. Moderate rain is commonly produced. Lightning is frequent, 11 to 15 cloud to ground strikes in a five-minute period.
LAL 5	Numerous thunderstorms. Rainfall is moderate to heavy. Lightning is frequent and intense, greater than 15 cloud to ground strikes in a five-minute period.
LAL 6	Dry lightning (same as LAL 3 but without rain). This type of lightning has the potential for extreme fire activity and is normally highlighted in fire weather forecasts with a Red Flag warning.

Source: National Weather Service



The heavy precipitation that San Luis Obispo County and all of California experiences is often the result of an atmospheric river. Atmospheric rivers are categorized by a unit of measurement known as the Integrated Water Vapor Transport (IVT), which takes into account the amount of water vapor in the system and the wind that moves it around. For a storm to be classified as an atmospheric river it has to reach an IVT threshold of 250 units; 1,000 IVT or more is considered to be “extreme” (Arcuni, 2019). In 2019 a system for categorizing the strength and impacts of atmospheric rivers was developed by the Center for Western Weather and Water Extremes (CW₃E), out of the Scripps Institution of Oceanography at UC San Diego. The newly developed scale ranks ARs into five categories from weak to exceptional. Unlike the Fujita scale for tornadoes that focuses on potential damages, the AR scale accounts for both storms that may be hazardous and storms that can provide benefits to the local water supply. A category one AR is considered to be primarily beneficial, generally lasting only 24 hours and produces modest rainfall. While a category five AR is considered “exceptional” and primarily hazardous, lasting for several days and associated with heavy rainfall and runoff that may cause significant damages. Table 5-16 below describes the scale further. The center developed the scale as a tool for officials with an operational need to assess flooding potential in their jurisdictions before the storms makes landfall.

In both February 2018 and 2019 the West Coast experienced six atmospheric rivers. But as the following figure from the Center for Western Weather and Water Extremes shows, California experienced vastly different precipitation totals due to the location of where the atmospheric river made landfall as well as each atmospheric river’s IVT. Using the AR scale developed by CW₃E, the ARs in February 2019 were all considered to be moderate to extreme and concentrated more on California, resulting in heavy precipitation.

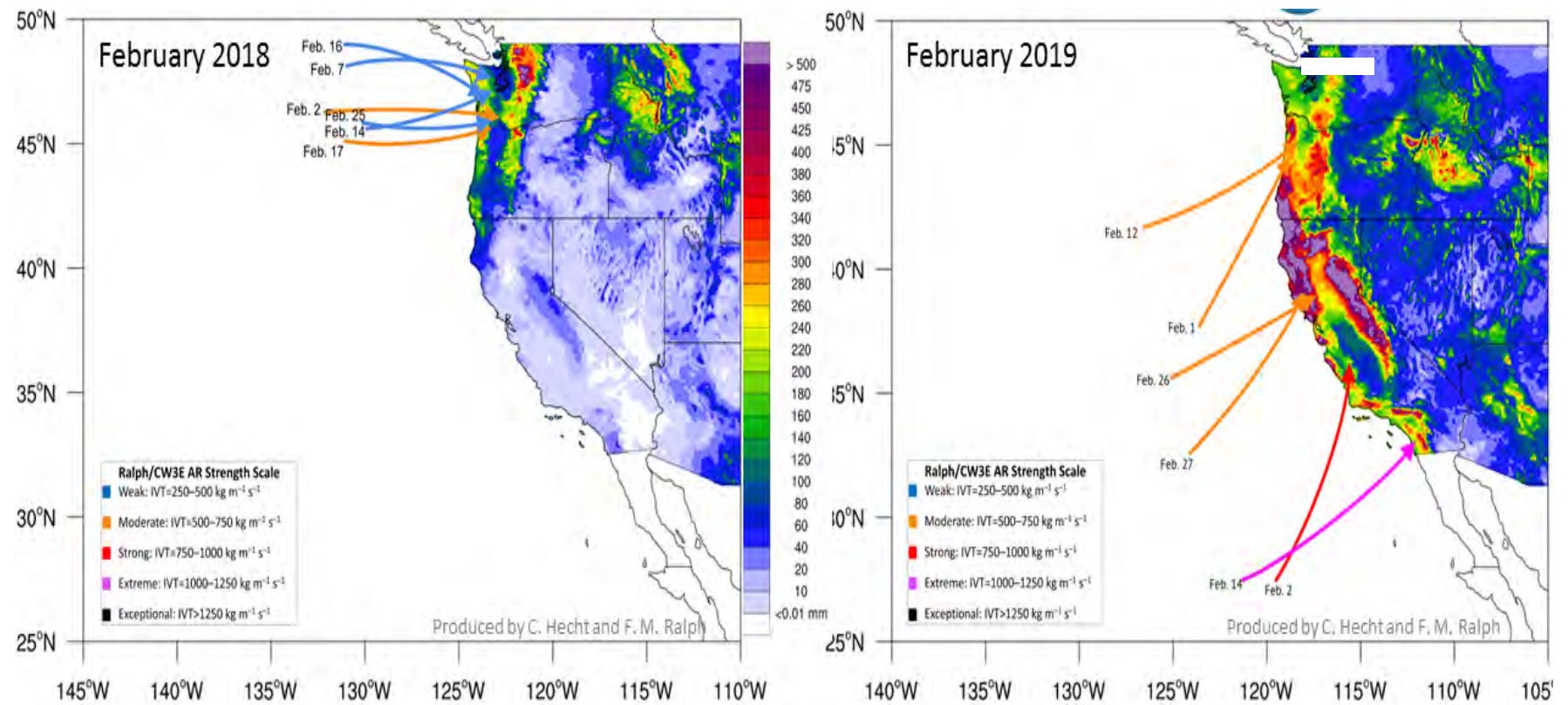
Table 5-16 Atmospheric River Categories

Category	Potential Impacts
AR Cat 1: Weak	Primarily beneficial. For example, a Feb. 2, 2017 AR hit California, lasted 24 hours at the coast, and produced modest rainfall.
AR Cat 2: Moderate	Mostly beneficial, but also somewhat hazardous. An atmospheric river on Nov. 19-20, 2016 hit Northern California, lasted 42 hours at the coast, and produced several inches of rain that helped replenish low reservoirs after a drought.
AR Cat 3: Strong	Balance of beneficial and hazardous. An atmospheric river on Oct. 14-15, 2016 lasted 36 hours at the coast, produced 5-10 inches of rain that helped refill reservoirs after a drought, but also caused some rivers to rise to just below flood stage.
AR Cat 4: Extreme	Mostly hazardous, but also beneficial. For example, an atmospheric river on Jan. 8-9, 2017 that persisted for 36 hours produced up to 14 inches of rain in the Sierra Nevada and caused at least a dozen rivers to reach flood stage.
AR Cat 5: Exceptional	Primarily hazardous. For example, a Dec. 29, 1996 to Jan. 2, 1997 atmospheric river lasted over 100 hours at the Central California coast. The associated heavy precipitation and runoff caused more than \$1 billion in damages.

Source: Center for Western Weather and Water Extremes, Scripps Institution of Oceanography at UC San Diego. Scale was developed by F. Martin Ralph Director of CW₃E in collaboration with Jonathan Rutz of NWS



Figure 5-5 Atmospheric River Strength and Land Distribution, February 2018 vs. February 2019



Source: Center for Western Weather and Water Extremes, Scripps Institution of Oceanography at UC San Diego

Previous Occurrences

Heavy rains and adverse storms occur in the San Luis Obispo County primarily during the late fall and winter but have a chance of occurring in every month of the year. According to information obtained from the Western Regional Climate Center (WRCC) the majority of precipitation is produced by storms during January and other winter months. Precipitation during the summer months is in the form of rain showers and is rare. Snowstorms, and hailstorms occur infrequently in San Luis Obispo County and severe occurrences of any of these are very rare. Damaging winds often accompany winter storm systems moving through the area and it is the winds experienced during the winter storms that result in the most wind-related damage. Refer to 5.3.3 for information related to wind events.

The NCEI records 21 heavy rain, hail and frost/freeze events that have taken place in San Luis Obispo County in the past 68 years (1950 –2018). No dense fog or lightning events have been recorded but does not mean they do not occur in the county; the HMPC noted in the 2014 plan that the National Weather Service issued fog advisories in 2011 and 2012.

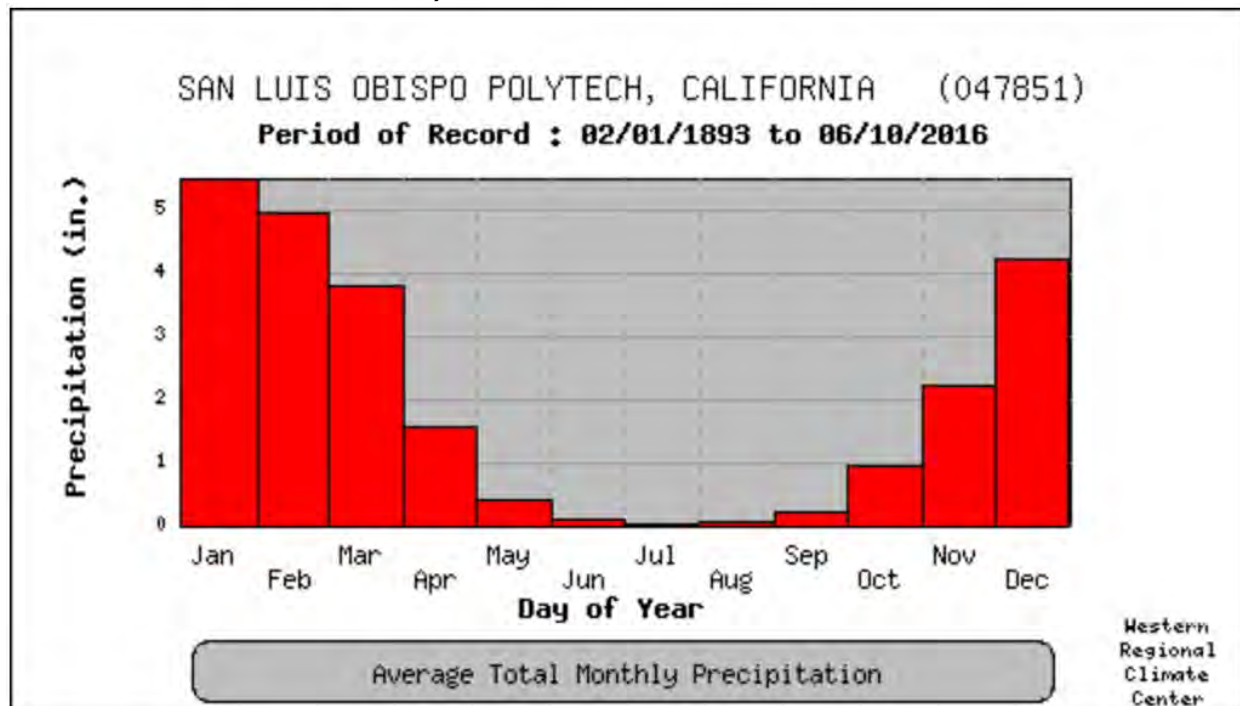
As shown in the NCEI records heavy rain storms can cause both widespread flooding which can lead to extensive localized drainage issues. In addition to the flooding that often occurs during these storms, strong winds, when combined with saturated ground conditions, can down very mature trees. Refer to the Flood section for more information related to flooding events in the county.

Information from the three representative weather stations introduced in subsection 5.3 Adverse Weather: General are summarized below and in Figure 5-6 through Figure 5-11

San Luis Obispo Polytech (Period of Record 1893 to 2012)

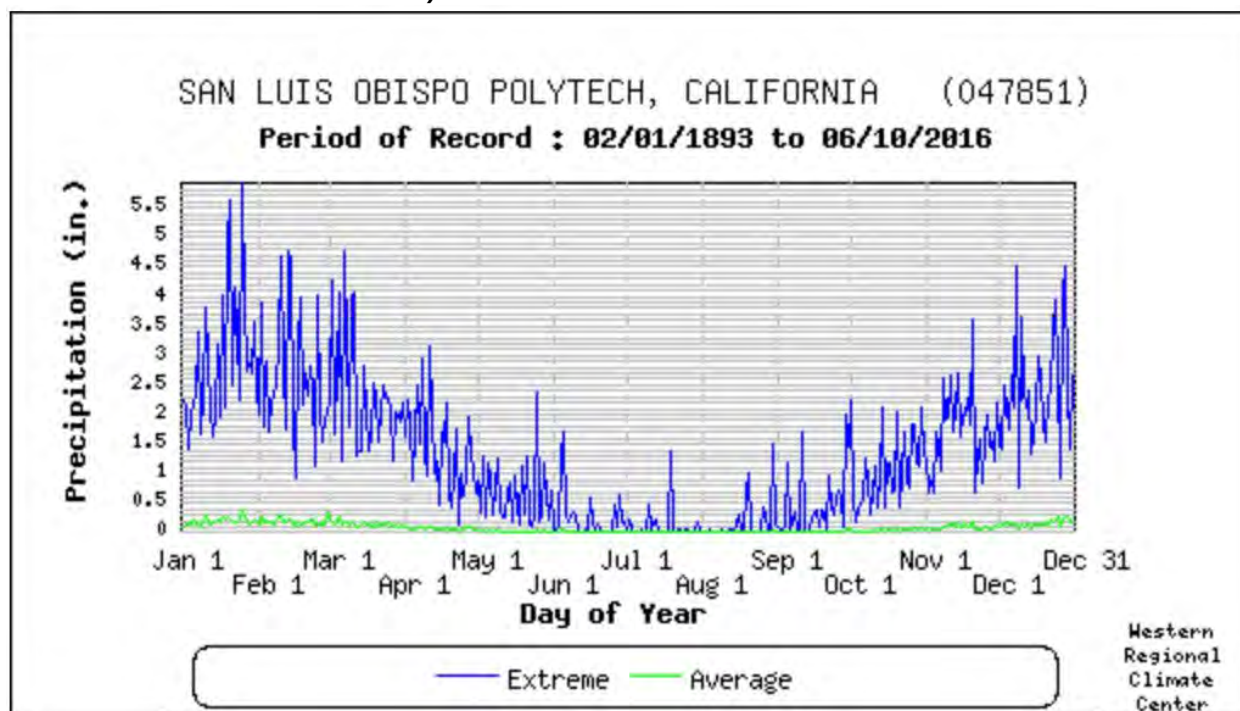
Information from the closest weather station with the most comprehensive data to represent the City of San Luis Obispo Area, the San Luis Obispo Polytech Weather Station, is summarized below in Figure 5-6 and Figure 5-7. Average annual precipitation in the interior valley is 22.40 inches per year. The highest recorded annual precipitation was 48.76 inches in 1969; the highest recorded precipitation for a 24-hour period is 5.90 inches on January 25, 1969. The lowest recorded annual precipitation was 7.37 inches in 1947.

Figure 5-6 City of San Luis Obispo Area - Monthly Average Total Precipitation (Period of Record 1893 -2016)



Source: Western Regional Climate Center, www.wrcc.dri.edu/

Figure 5-7 City of San Luis Obispo Area - Daily Precipitation Average and Extreme (Period of Record 1893-2016)

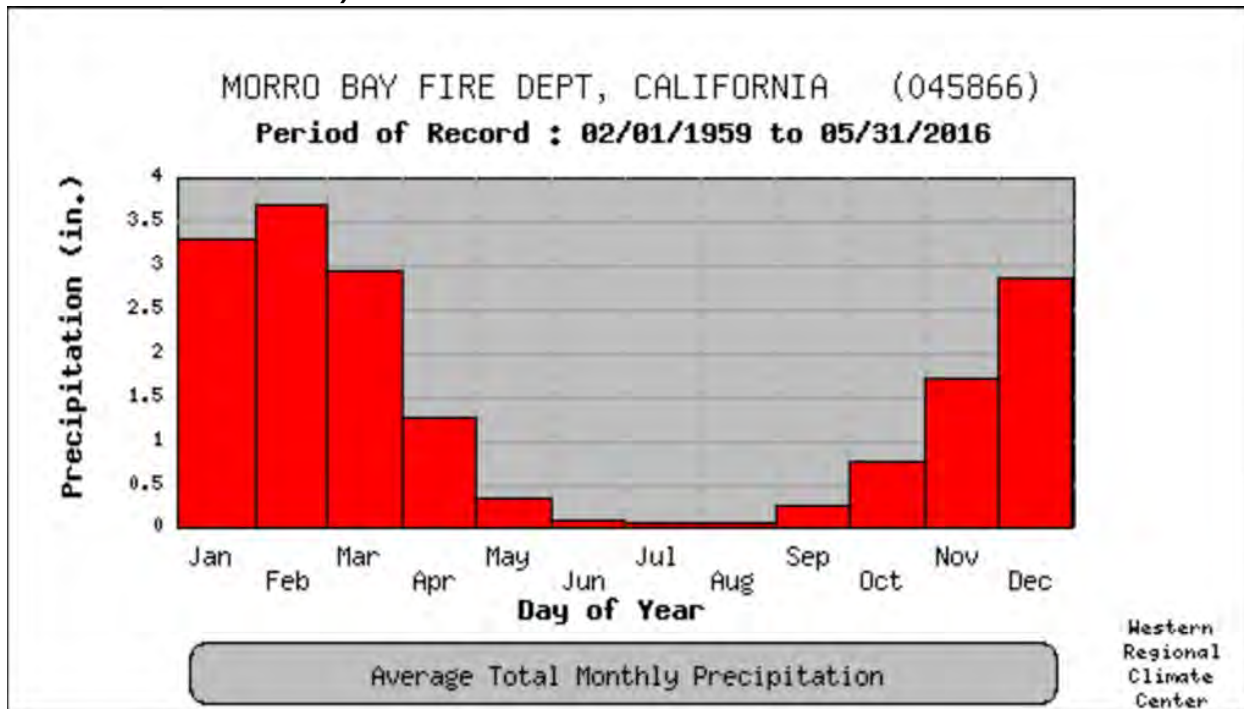


Source: Western Regional Climate Center, www.wrcc.dri.edu/

North County Coastal Area - Morro Bay Fire Department Weather Station (Period of Record 1959 to 2012)

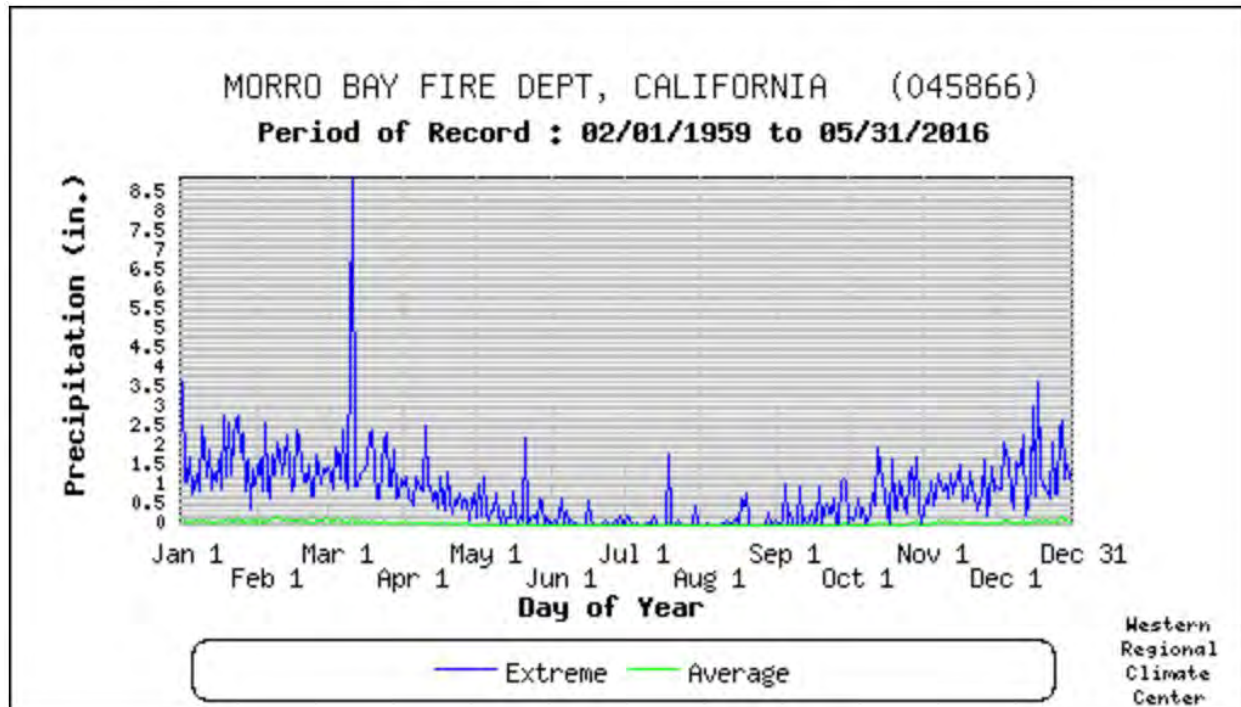
Information from the closest weather station with the most comprehensive data to represent the North County Coastal Area of San Luis Obispo, the Morro Bay Fire Department Weather Station, is summarized below in Figure 5-8 and Figure 5-9. Average annual precipitation in the interior valley is 16.74 inches per year. The highest recorded annual precipitation was 37.01 inches in 1995; the highest recorded precipitation for a 24-hour period is 8.82 inches on March 11, 1995. The lowest recorded annual precipitation was 6.18 inches in 2007.

Figure 5-8 North County Coastal Area - Monthly Average Total Precipitation (Period of Record 1959 -2016)



Source: Western Regional Climate Center, www.wrcc.dri.edu/

Figure 5-9 North County Coastal Area - Daily Precipitation Average and Extreme (Period of Record 1959-2016)

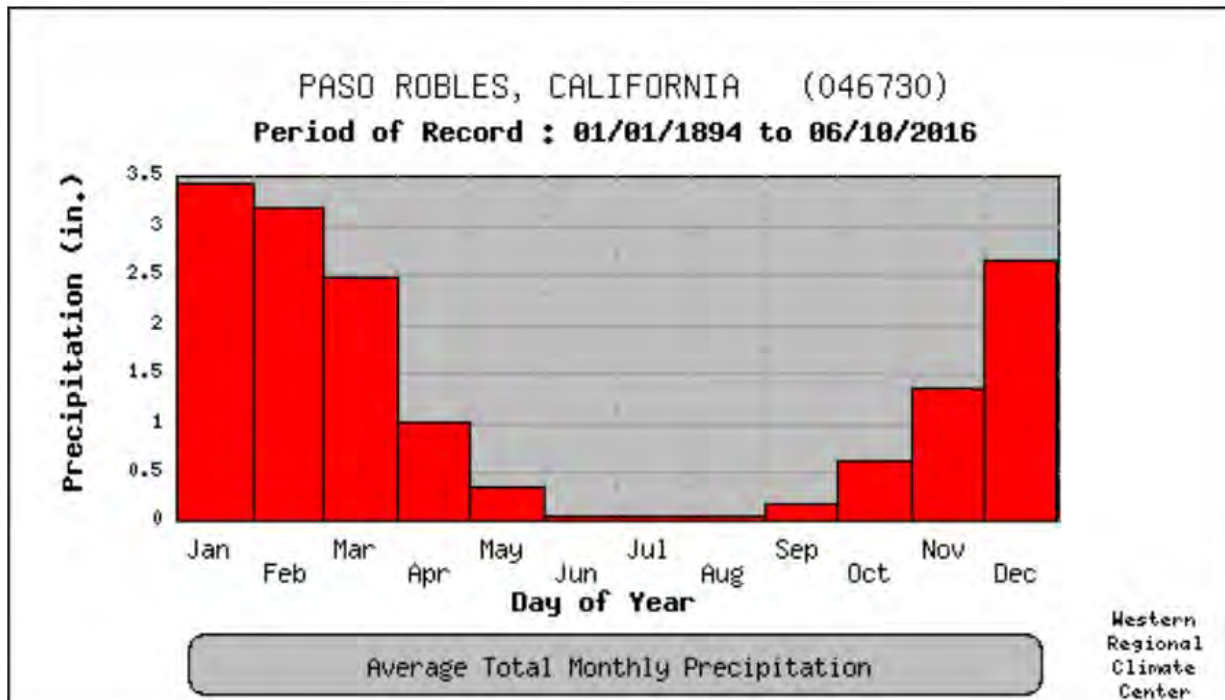


Source: Western Regional Climate Center, www.wrcc.dri.edu/

North County Inland Area - Paso Robles Weather Station (Period of Record 1894 to 2012)

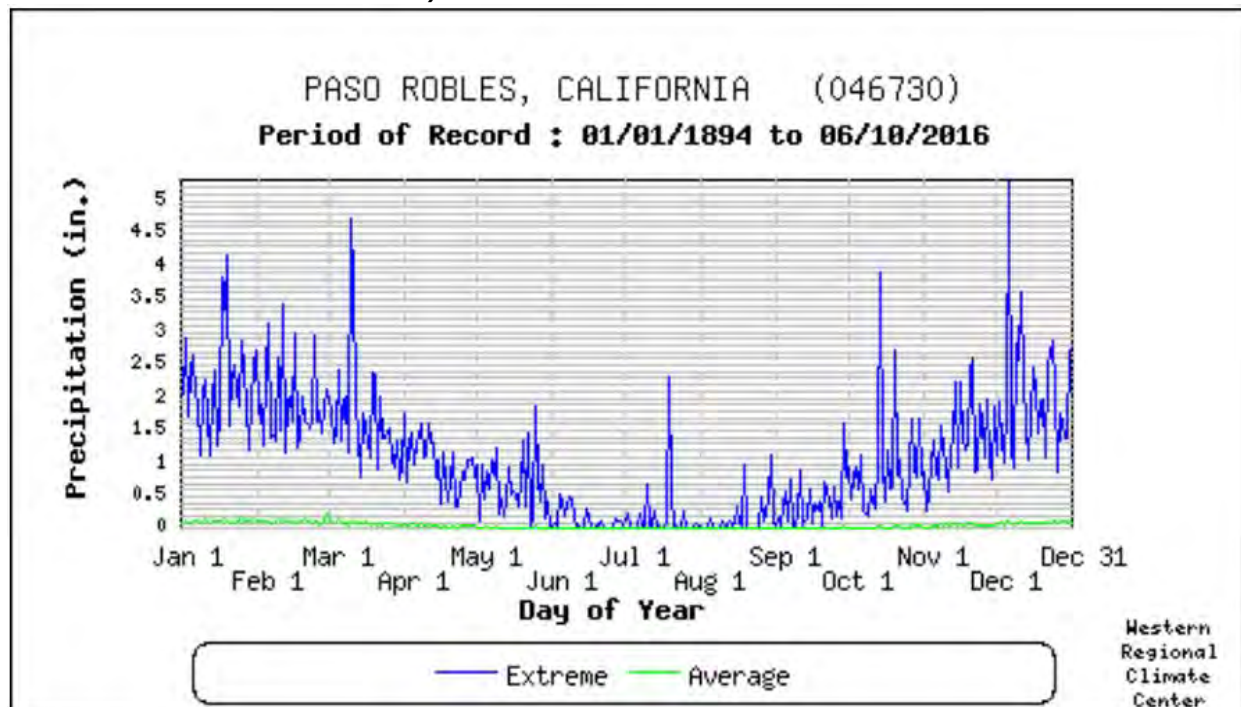
Information from the closest weather station with the most comprehensive data to represent the North County Inland Area of the county, Paso Robles Weather Station, is summarized below in Figure 5-10 and Figure 5-11. Average annual precipitation in this region of the county is 15.21 inches per year. The highest recorded annual precipitation was 29.19 inches in 1941; the highest recorded precipitation for a 24-hour period is 5.25 inches on December 6, 1966. The lowest recorded annual precipitation was 4.24 inches in 1947.

Figure 5-10 North County Inland Area - Monthly Average Total Precipitation (Period of Record 1894 -2016)



Source: Western Regional Climate Center, www.wrcc.dri.edu/

Figure 5-11 North County Inland Area - Daily Precipitation Average and Extreme (Period of Record 1894-2016)

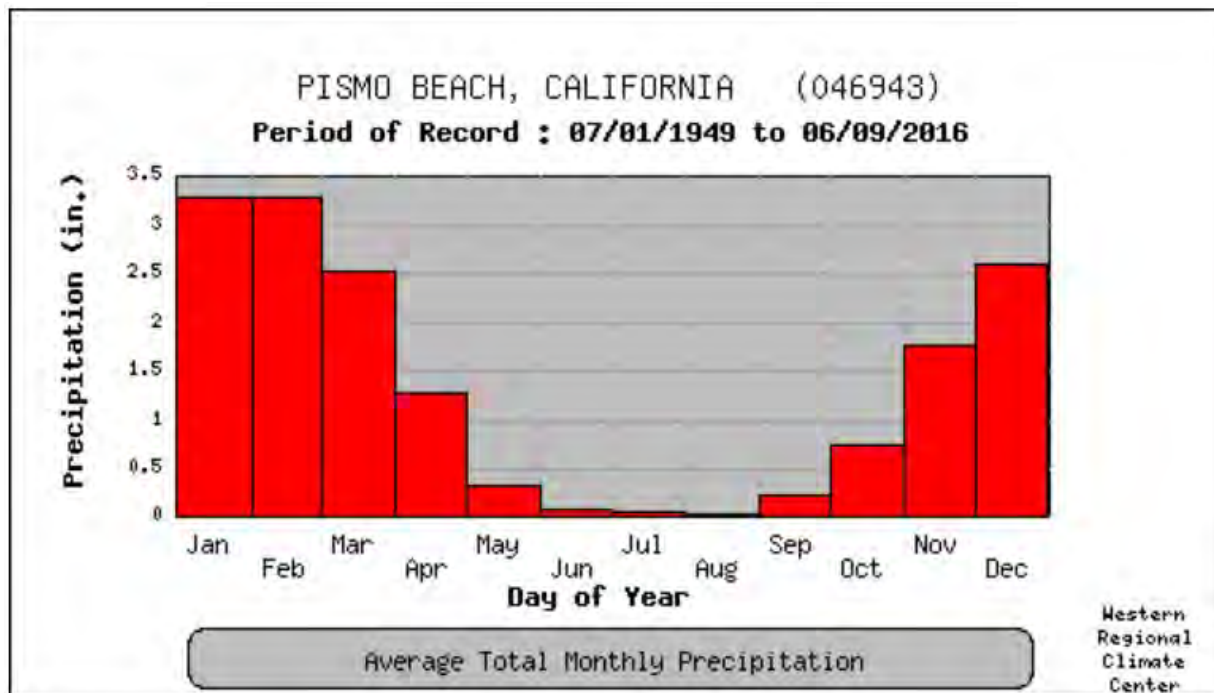


Source: Western Regional Climate Center, www.wrcc.dri.edu/

South County Area - Pismo Beach Weather Station (Period of Record 1949 to 2016)

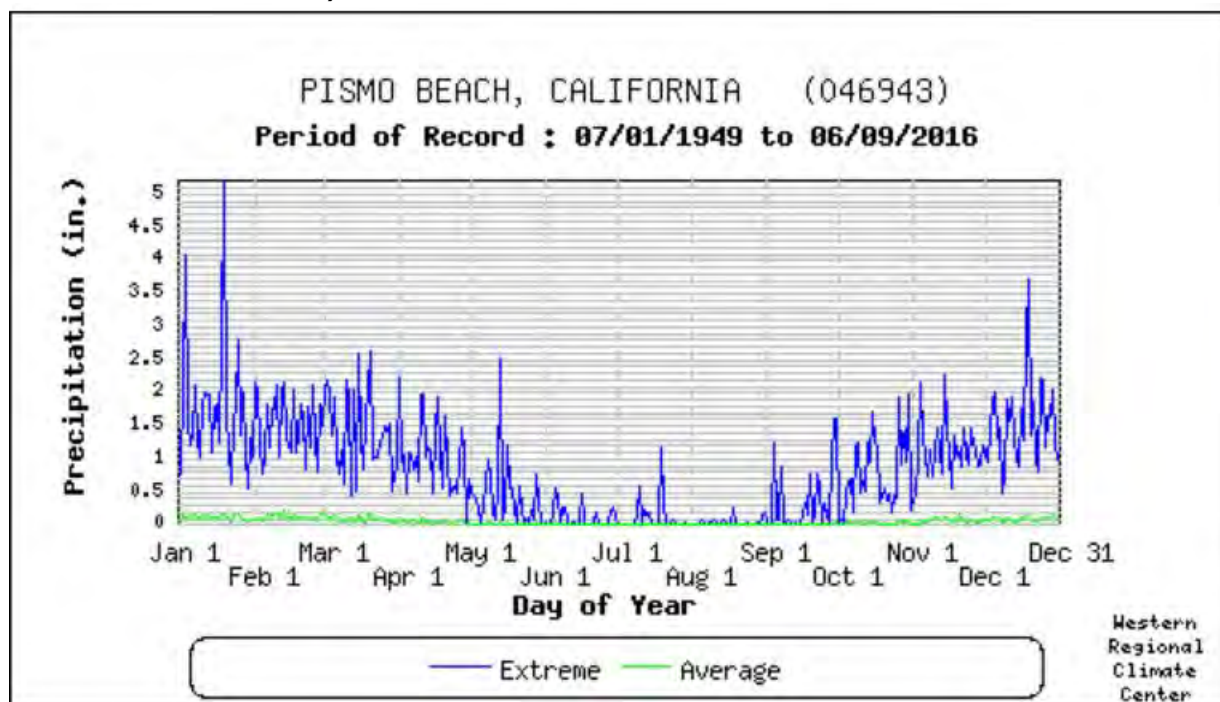
Information from the closest weather station with the most comprehensive data to represent the South County Area of the county, Pismo Beach Weather Station, is summarized below in Figure 5-12 and Figure 5-13. Average annual precipitation in this region of the county is 16.96 inches per year. The highest recorded annual precipitation was 32.58 inches in 1983; the highest recorded precipitation for a 24-hour period is 5.16 inches on January 19, 1969. The lowest recorded annual precipitation was 4.49 inches in 1989.

Figure 5-12 South County Area - Monthly Average Total Precipitation (Period of Record 1949 - 2016)



Source: Western Regional Climate Center, www.wrcc.dri.edu/

Figure 5-13 South County Area - Daily Precipitation Average and Extreme (Period of Record 1949-2016)



Source: Western Regional Climate Center, www.wrcc.dri.edu/

The following table reports the records collected from the NCEI Storm Events Database for heavy rain, hail and frost/freeze events. No dense fog events are reported in the database. Table 5-17 is a summary of the most significant adverse weather events as recorded in the NCEI Storm Events.

Table 5-17 San Luis Obispo County Heavy Rain/Hail/Freeze Events, 1950-2018

Event Type	Date	Magnitude	Property Damage	Crop Damage	Deaths	Injuries
Heavy Rain						
	2/20/1996	4-6 in.	0	0	0	0
	11/ 10/1997	0.50-1.50 in. (coastal) 3.0 in. (mountains)	0	0	0	0
	1/10/2001	2-5 in. (coastal) 5-10 in. (mountains)	0	0	0	0
	2/11/2001	2-8 in.	0	0	0	0
	2/ 24/2001	1-4 in.	0	0	0	0
	3/4/2001	2-6 in. (coastal) 6-13 in. (mountains)	0	0	0	0
	12/ 27/2004	2-8 in. (coastal) 6-13 in. (mountains)	0	0	0	0
	12/ 30/2004	1-3 in. (coastal) 3-6 in. (mountains)	0	0	1	0
	1/7/2005	3-10 in.	\$5,000,000	0	0	0
Hail						
	3/6/2001	0.75 in.	0	0	0	0

Event Type	Date	Magnitude	Property Damage	Crop Damage	Deaths	Injuries
	2/23/2005	0.75 in.	0	0	0	0
	5/28/2009	0.75 in.	0	0	0	0
	3/22/2017	1 in.	0	0	0	0
Frost/Freeze						
	12/21/1998	-	0	\$83,000,000*	0	0
	1/13/2007	-	0	\$25,000,000	0	0
Totals			\$5,000,000	\$108,000,000	1	0

Source: NCEI Storm Events Database

*Note this recorded crop damage amount is representative of a four-county area

Table 5-18 Past Thunderstorm/Heavy Rain/Dense Fog/Freeze Events, 1950-2018

Date of Event	Incident Description
February 18, 1993	Thunderstorms -A thunderstorm caused damage to many of the same areas as winds to nearly 50 mph. Pea-sized hail was reported at Pismo Beach. Power outages due to lightning strikes were reported in Nipomo and San Luis Obispo. \$50,000 in property damage was reported
February 20, 1996	Heavy rain in the mountains of San Luis Obispo County led to 4-6 inches of rain and caused urban and small stream flooding and associated mudslides in the steep terrain and along Hwy 1 and 101.
February 2, 1998	Along with the strong winds (refer to Table 5-5 for information on the wind event), heavy rain drenched the entire area. On average, rainfall totals ranged from 2 to 8 inches over coastal areas, up to 12 inches in the mountains. Widespread flooding was reported in all areas (refer to the past events table in the Flood section).
February 5, 1998	Strong winds, gusting up to 70 mph, knocked down many trees and power lines. Rainfall totals ranged from 1 to 3 inches over coastal areas, up to 6 inches in the mountains. Numerous flooding problems were reported across the area. Most highways, including the 1, 101, 126 and 154 were closed due to flooding or mudslides.
December 21-24, 1998	Freeze. An unseasonable cold air mass produced a three-night period of sub-freezing temperatures across Central and Southern California. The California Department of Food and Agriculture reported over \$83 million in crop losses over the four-county area. Crop damage in San Luis Obispo was reported to be a total of \$5.4 million.
1990 to present (events number more than 5)	Very cold Pacific storms brought snow fall to the higher elevations of the county. On rare occasions, it caused damage to the naturally occurring vegetation. This resulted in an increased fire season threat as the damaged vegetation dried out and augmented the normal fuel loading. The snow caused rare transportation impacts on Hwy. 101 at Cuesta Grade and Hwys 41 and 46 at higher elevations.
March 4, 2001	A powerful and slow-moving storm brought heavy rain, strong winds and snow to Central and Southern California. Across San Luis Obispo and Santa Barbara counties, rainfall totals ranged from 2 to 6 inches over coastal and valley areas to 6 to 13 inches in the mountains. In San Luis Obispo County, the heavy rain produced numerous flooding. Refer to the Flood section for information related to the resulting flood event.
March 6, 2001	A severe thunderstorm produced dime size hail in the community of Santa Margarita.

Date of Event	Incident Description
December 30, 2004	A powerful Pacific storm brought more heavy rain, snow and flash flooding to Central and Southern California. Total rainfall amounts ranged from 1 to 3 inches on the coastal plain to between 3 and 6 inches in the mountains. Refer to the Flood section for information on the resulting flooding.
February 23, 2005	Nickel size hail was reported in a remote area of San Luis Obispo county.
January 13-15, 2007	A very cold arctic storm brought widespread freezing temperatures and some gusty offshore winds to the area. Across the agricultural areas of San Luis Obispo, Santa Barbara, Ventura and Los Angeles counties, the freezing overnight temperatures nearly \$350 million in crop damages. Widespread freezing conditions were reported across agricultural areas. Total crop damages in San Luis Obispo county were estimated to be around \$25 million.
May 28, 2009	A severe thunderstorm was reported in San Luis Obispo county near the community of La Panza. Three quarter inch hail was reported by the local fire station.
April 2011	In mid-April, a bitter cold weather system sent temperatures plunging to the mid-20's, bringing hail and freezing rain for at least two nights and in some lower elevation areas, three or four. Thousands of acres of vineyards lost newly emerging grape buds, which experts say could amount to 50% of the area's 2011 crop. Loss estimates range from 70 to 80 million dollars.
July 19, 2015	Paso Robles received nearly 3.6 inches of rain in less than 8 hours. The intense rainfall (remnant of Hurricane Dolores) eroded bare hillsides located outside the City limits and caused very high volumes of sediment to fill City drainage ways and culverts. 20-30 homes were impacted causing mud and water damage.
March 22, 2017	Several strong thunderstorms developed across the Central Coast of California. In Creston, a severe thunderstorm developed, producing one-inch hail.

Source: NCEI Storm Events Database, 2014 County LHMP, HMPC

In February 2019, San Luis Obispo County experienced severe winter storms that caused heavy rain, hail, and light snow showers in some areas of the county. The National Weather Service issued a freeze warning for the County on February 18th, 2019 that lasted until February 22nd, 2019. The County had been experiencing drought conditions throughout 2018 but received enough rain in the 2019 season to bring it out of the abnormally dry and drought conditions for the first time in 11 years (San Luis Obispo Tribune, 2019). Refer to the Drought section for more information related to drought conditions in the county. On February 25th, 2019 Caltrans announced it would be closing portions of Highway 1 along the Central Coast, in anticipation of a heavy rain event and would not be reopening the highway until the end of that week after the storm passes to allow for crews to inspect and clean up the highway (San Luis Obispo Tribune, 2019).

The county continued to experience severe winter storms into March 2019. On March 5th, 2019 a severe thunderstorm, brought heavy rain, thunder and lightning to the South County area. The National Weather Service's Los Angeles station reported that the region, San Luis Obispo, Santa Barbara, Los Angeles and Ventura counties, received 4,500 lightning strikes including about 2,500 cloud-to-ground strikes (San Luis Obispo Tribune, 2019). At one point the NWS recorded 1,489 in one five-minute stretch alone off the



coast of Central Coast region (Los Angeles Times, 2019). The county and the region are accustomed to thunderstorms with the occasional lightning strike accompanying the storms, but this amount of lightning strikes in one thunderstorm event is rare. The storm also caused 300 residents in Grover Beach, 149 residents in rural Arroyo Grande and 70 near See Canyon Road in San Luis Obispo for a total 519 residents in the county to lose power due to the winter storm. Power was restored by the next morning. The California Highway Patrol (CHP) reported multiple car accidents and downed trees due to same adverse weather event.

Probability of Future Occurrences

Highly Likely – Thunderstorms that produce heavy rain with the potential for hail to develop are well-documented seasonal occurrences that will continue to occur annually in the San Luis Obispo planning area.

Climate Change Considerations

As average temperatures increase over time, this generally will result in higher extreme temperatures and more warming in the atmosphere can trigger climate changes, which could result in more frequent extreme weather events. According to California's Fourth Climate Change Assessment, Central Coast Region Report (2018), the number of days each year on which the atmospheric rivers bring "extreme" amounts of rain and snow to the region are expected to increase under the projected climate change for the state, possibly increasing more than a quarter. Pacific Northwest National Laboratory researchers have also found that atmospheric rivers will reach the West Coast more frequently (Gao, 2015). Currently, the West receives rain or snow from these atmospheric rivers between 25 and 40 days each year. By the end of this century, days on which the atmospheric rivers reach the coast could increase by a third this century, between 35 and 55 days a year.

According to the climate change analysis completed for the 2014 San Luis Obispo County Integrated Regional Water Management Plan precipitation is projected to increase in winter months while decreasing in the spring months, with the greatest change expected to take place in the North County Coastal Area. Decreases in precipitation in spring months will also have an impact on runoff which may have an impact on water supply sources, refer to the Drought section for more information on water supply vulnerability; while the projected increases in precipitation in the spring months will also increase the county's risk to flooding in some areas, refer to the Flood section for more information in flooding risk and vulnerability. The Fourth Climate Change Assessment for the Central Coast region projects an increase of 3 to 10 inches across the five counties in the central coast.

Vulnerability: Thunderstorm/Heavy Rain/Dense Fog/Freeze

General Property

The San Luis Obispo County Planning Area experiences a rainy season in the winter months through early spring. These winter storms can include significant precipitation as well as high winds, and hail. The primary effect of these storms has not resulted in significant injury or damages to people and property, or the losses are typically covered by insurance. It is the secondary hazards caused by weather, such as floods, that have had the greatest impact on the County. Damage and disaster declarations related to adverse weather have occurred and will continue to occur in the future. Heavy rain and thunderstorms are the most frequent type of severe weather occurrences in the County. Utility outages, downing of trees,

debris blocking streets and damage to property can be a direct result of these storm events. Given the nature of these types of storms, the entire County is potentially at risk.

People

Exposure is the greatest danger to people from severe thunderstorms. People can be hit by lightning, pelted by hail, and caught in rising waters. Serious injury and loss of human life is rarely associated with hailstorms.

Reduced visibility is the greatest risk to people when heavy fog is prevalent. Particularly when fog is dense, it can be hazardous to drivers, mariners and aviators and contributes to numerous accidents each year. To reduce injury and harm, people should avoid driving when dense fog is prevalent, if possible. If driving is pertinent, emergency services advise driving with lights on low beam, avoiding stopping on highways, and avoiding crossing traffic lanes.

Aspects of the population who rely on constant, uninterrupted electrical supplies may have a greater, indirect vulnerability to lightning. As a group, the elderly or disabled, especially those with home health care services relying on rely heavily on an uninterrupted source of electricity. Resident populations in nursing homes, residential facilities, or other special needs housing may also be vulnerable if electrical outages are prolonged. If they do not have a back-up power source, rural residents and agricultural operations reliant on electricity for heating, cooling, and water supplies are also especially vulnerable to power outages.

Social Vulnerability

Outdoor laborers are particularly at risk to thunderstorms and the association hazards of precipitation, hail and the increased risk of being struck by lightning. Based on the SoVI data presented and discussed in subsection 4.4.1, the communities located in north county San Luis Obispo such as Paso Robles, San Miguel and Atascadero and in south county such as Oceano and Nipomo, where many agricultural activities take place are also among the areas of the county with the highest ranking overall social vulnerability.

Critical Facilities and Infrastructure

Because of the unpredictability of severe thunderstorm and a tornado event strength and path, most critical infrastructure that is above ground is equally exposed to the storm's impacts. Due to the random nature of these hazards, a more specific risk assessment was not conducted for this plan.

Economy

Economic impact of a severe thunderstorm is typically short term. Lightning can cause power outages and fires. Hail can destroy exposed property; an example is car lots, where entire inventories can be damaged. Generally, long-term economic impacts center more around hazards that cascade from a severe thunderstorm, including wildfires ignited by lightning, and flooding (refer to the Flood section).

In general, all adverse weather poses a risk to agriculture economy in the county. Table 5-19 below describes the crops losses related to adverse weather events and associated indemnity amounts or loss payments from the United States Department of Agriculture (USDA), Risk Management Agency in the past three years. Heat, frost/freeze, and high wind/excess wind events have been the cause of the majority of crop losses related to weather since 2015. Overall, in the past three years there have been 200 adverse

weather events that have led to crop losses in the county, totaling in over \$20 million in loss payments due to adverse weather.

Table 5-19 San Luis Obispo County Crop Losses and Loss Payments, 2015-2018

Cause of Loss	Number of Events	Indemnity Amounts (loss payments)
Frost/Freeze	45	\$6,713,314
Cold Winter	5	\$43,037
Excess Moisture/Cold Wet Weather	47	\$6,457,335
Hail	3	\$36,272
Heat	64	\$3,569,208
Wind/Excess Wind	33	\$3,133,818
Other	3	\$51,683
Totals	200	\$20,004,667

Source: USDA Risk Management Agency, <https://www.rma.usda.gov/SummaryOfBusiness/CauseOfLoss>

Historic, Cultural, and Natural Resources

Severe thunderstorms are a natural environmental process. Environmental impacts include the sparking of potentially destructive wildfires by lightning and localized flattening of plants by hail. As a natural process, the impacts of most severe thunderstorms by themselves are part of the overall natural cycle and do not cause long-term consequential damage.

Future Development

New critical facilities, such as communication towers should be built to withstand heavy rain, wind, and hail damage. Future development projects should consider adverse weather hazards at the planning, engineering and architectural design stage with the goal of reducing vulnerability. Stormwater master planning and site review should account for buildings to withstand adverse weather events considered for all new development. Thus, development trends in the County are not expected to increase overall vulnerability to the hazard but all development will be affected by adverse weather and storm events and population growth will increase potential exposure to hazards such as thunderstorms and dense fog.

Risk Summary - Thunderstorm/Heavy Rain/Dense Fog/Freeze

- The overall impact to the community from severe weather events associated with heavy rain, thunderstorms, hail, and fog could include:
- San Luis Obispo County has experienced 21 hail, heavy rain, and frost/freeze events in past 68 years
- Average annual precipitation ranges from 22.4 inches to 15.2 inches depending on the area of the County
- Since 2015 over \$20 million in loss payments from USDA related to crop losses from adverse weather events have been paid.
- *Related hazards:* Flood, Wildfire, Landslide and Debris Flow, Coastal Storm/Coastal Erosion/Sea Level Rise, Agriculture/Pest Infestation/Plant Disease/Tree Mortality

Table 5-20 Hazard Risk Summary - Thunderstorm/Heavy Rain/Dense Fog/Freeze

Jurisdiction	Geographic Area	Probability of Future Occurrence	Magnitude/Severity	Overall Significance
San Luis Obispo County	Significant	Likely	Negligible	Medium
City of Arroyo Grande	Significant	Likely	Limited	Low
City of Atascadero	Significant	Likely	Limited	Low
City of Grover Beach	Significant	Likely	Limited	Low
City of Morro Bay	Extensive	Highly Likely	Limited	High
City of Paso Robles	Significant	Highly Likely	Limited	High
City of Pismo Beach	Significant	Likely	Limited	Low
City of San Luis Obispo	Extensive	Likely	Limited	Medium
Avila Beach CSD	Significant	Occasional	Negligible	Medium
Ground Squirrel Hollow CSD	Limited	Likely	Negligible	Medium
Heritage Ranch CSD	Extensive	Highly Likely	Critical	High
Los Osos CSD	Significant	Likely	Limited	Medium
Nipomo CSD	Limited	Likely	Negligible	Low
San Miguel CSD	Extensive	Likely	Catastrophic	High
San Simeon CSD	Likely	Significant	Limited	Low
Templeton CSD	Significant	Highly Likely	Limited	High
Cayucos Sanitary District	Extensive	Likely	Critical	High
Port San Luis Harbor District	Extensive	Highly Likely	Limited	Medium
San Luis Obispo FCWCD	Significant	Highly Likely	Negligible	Low
South San Luis Obispo Sanitary District	Significant	Likely	Limited	Low



5.3.3 Adverse Weather: High Wind/Tornado

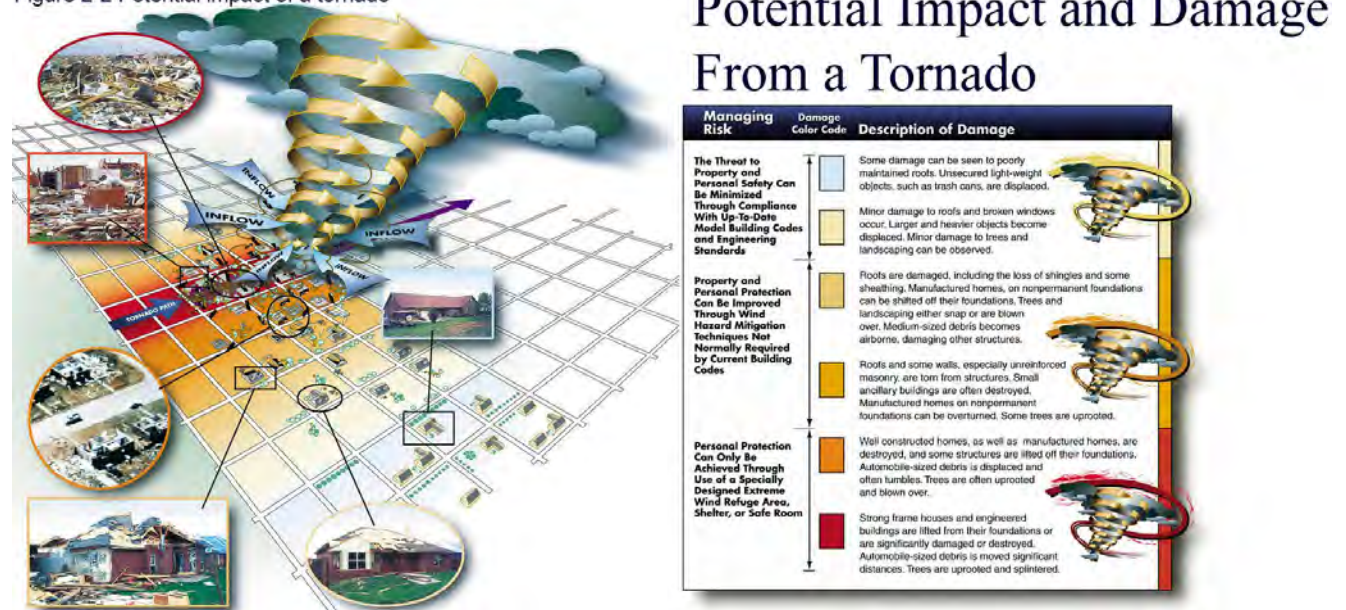
Hazard/Problem Description

High winds, often accompanying severe thunderstorms, can cause significant property and crop damage, threaten public safety, and have adverse economic impacts from business closures and power loss. Windstorms in San Luis Obispo County are typically straight-line winds. Straight-line winds are generally any thunderstorm wind that is not associated with rotation (i.e., is not a tornado). It is these winds, which can exceed 100 mph, that represent the most common type of severe weather and are responsible for most wind damage related to thunderstorms. These winds can overturn mobile homes, tear roofs off houses, topple trees, snap power lines, shatter windows, and sandblast paint from cars. Other associated hazards include utility outages, arcing power lines, debris blocking streets, dust storms, and an occasional structure fire.

Tornadoes are another severe weather hazard that can affect the San Luis Obispo County planning area. Tornadoes form when cool, dry air sits on top of warm, moist air. Tornadoes are rotating columns of air marked by a funnel-shaped downward extension of a cumulonimbus cloud whirling at destructive speeds of up to 300 mph, usually accompanying a thunderstorm. Tornadoes are the most powerful storms that exist. They can have the same pressure differential that fuels 300-mile-wide hurricanes across a path only 300-yards wide or less. Figure 5-14 illustrates the potential impact and damage from a tornado.

Figure 5-14 Potential Impact and Damage from a Tornado

Figure 2-2 Potential impact of a tornado



Source: FEMA: Building Performance Assessment: Oklahoma and Kansas Tornadoes

Prior to February 1, 2007, tornado intensity was measured by the Fujita (F) scale. This scale was revised and is now the Enhanced Fujita scale. Both scales are sets of wind estimates (not measurements) based on damage. The new scale provides more damage indicators (28) and associated degrees of damage, allowing for more detailed analysis and better correlation between damage and wind speed. It is also more precise because it takes into account the materials affected and the construction of structures

damaged by a tornado. Table 5-21 shows the wind speeds associated with the original Fujita scale ratings and the damage that could result at different levels of intensity. Table 5-22 shows the wind speeds associated with the Enhanced Fujita Scale ratings. The Enhanced Fujita Scale's damage indicators and degrees of damage can be found online at www.spc.noaa.gov/efscale/ef-scale.html.

Table 5-21 Original Fujita Scale

Fujita (F) Scale	Fujita Scale Wind Estimate (mph)	Typical Damage
F0	< 73	Light damage. Some damage to chimneys; branches broken off trees; shallow-rooted trees pushed over; sign boards damaged.
F1	73-112	Moderate damage. Peels surface off roofs; mobile homes pushed off foundations or overturned; moving autos blown off roads.
F2	113-157	Considerable damage. Roofs torn off frame houses; mobile homes demolished; boxcars overturned; large trees snapped or uprooted; light-object missiles generated; cars lifted off ground.
F3	158-206	Severe damage. Roofs and some walls torn off well-constructed houses; trains overturned; most trees in forest uprooted; heavy cars lifted off the ground and thrown.
F4	207-260	Devastating damage. Well-constructed houses leveled; structures with weak foundations blown away some distance; cars thrown, and large missiles generated.
F5	261-318	Incredible damage. Strong frame houses leveled off foundations and swept away; automobile-sized missiles fly through the air in excess of 100 meters (109 yards); trees debarked; incredible phenomena will occur.

Source: National Oceanic and Atmospheric Administration Storm Prediction Center, www.spc.noaa.gov/faq/tornado/f-scale.html

Table 5-22 Enhanced Fujita Scale

Enhanced Fujita (EF) Scale	Enhanced Fujita Scale Wind Estimate (mph)	Potential Damage
EF0	65-85	Minor damage. Peels surface off some roofs; some damage to gutters or siding; branches broken off trees; shallow-rooted trees pushed over. Confirmed tornadoes with no reported damage (i.e., those that remain in open fields) are always rated EF0.
EF1	86-110	Moderate damage. Roofs severely stripped; mobile homes overturned or badly damaged; loss of exterior doors; windows and other glass broken.
EF2	111-135	Considerable damage. Roofs torn off from well-constructed houses; foundations of frame homes shifted; mobile homes completely destroyed; large trees snapped or uprooted; light-object missiles generated; cars lifted off ground.



Enhanced Fujita (EF) Scale	Enhanced Fujita Scale Wind Estimate (mph)	Potential Damage
EF3	136-165	Severe damage. Entire stories of well-constructed houses destroyed; severe damage to large buildings such as shopping malls; trains overturned; trees debarked; heavy cars lifted off the ground and thrown; structures with weak foundations are badly damaged.
EF4	166-200	Devastating damage. Well-constructed and whole frame houses completely leveled; cars and other large objects thrown, and small missiles generated.
EF5	Over 200	Incredible damage. Strong-framed, well-built houses leveled off foundations are swept away; steel-reinforced concrete structures are critically damaged; tall buildings collapse or have severe structural deformations; some cars, trucks, and train cars can be thrown approximately 1 mile (1.6 km).

Source: National Oceanic and Atmospheric Administration Storm Prediction Center, www.spc.noaa.gov/faq/tornado/ef-scale.html

Table 5-23 below outlines the Beaufort scale, which describes the damaging effects of wind speed.

Table 5-23 Beaufort Wind Scale

Wind Speed (mph)	Description – Visible Condition
0	Calm; smoke rises vertically
1-4	Light air; direction of wind shown by smoke but not by wind vanes
4-7	Light breeze; wind felt on face; leaves rustle; ordinary wind vane moved by wind
8-12	Gentle breeze; leaves and small twigs in constant motion; wind extends light flag
13-18	Moderate breeze; raises dust and loose paper; small branches are moved
19-24	Fresh breeze; small trees in leaf begin to sway; crested wavelets form on inland water
25-31	Strong breeze; large branches in motion; telephone wires whistle; umbrellas used with difficulty
32-38	Moderate gale whole trees in motion; inconvenience in walking against wind
39-46	Fresh gale breaks twigs off trees; generally, impedes progress
47-54	Strong gale slight structural damage occurs; chimney pots and slates removed
55-63	Whole gale trees uprooted; considerable structural damage occurs
64-72	Storm very rarely experienced; accompanied by widespread damage
73+	Hurricane devastation occurs

Source: NWS



High winds and tornadoes can cause damage to property and loss of life. While most tornado damage is caused by violent winds, most injuries and deaths result from flying debris. Property damage can include damage to buildings, fallen trees and power lines, broken gas lines, broken sewer and water mains, and the outbreak of fires. Agricultural crops and industries may also be damaged or destroyed. Access roads and streets may be blocked by debris, delaying necessary emergency response.

Geographic Area

Wind and tornadoes have the potential to happen anywhere in the County. The resulting damage from wind and tornado events may be most severe in the downtown areas of incorporate communities where there are more large trees, infrastructure, and higher density development.

Extent

Based on NCEI records between 1950 and 2018 there have been a combined 31 high wind/thunderstorm winds (27 events) and four tornado/funnel cloud events in San Luis Obispo County which has resulted in a total of \$4,050,000 in property damage. The most damaging event took place on January 2, 2006 and was a 56-mph wind event that resulted in \$4,000,000 in property damages. Overall, high wind event impacts would likely be limited, with a majority of impacts being related to property damages caused by downed trees as well as power outages.

In the past 68 years all the tornado events that have taken place in San Luis Obispo County have been F0 tornadoes. However, it should be noted that, although unlikely, larger tornadoes could occur. Should the County be hit by an EF-3 or higher tornado, it can be extrapolated that because of its relative size and the potential size and length of a tornado's path a significant portion of the County could be impacted, resulting in property and crop damage and loss of life.

Tornado impacts to the County would likely be negligible, with less than 10 percent of the planning area affected by events in the EF0-2 range, though stronger tornadoes are possible. The impact to quality of life or critical facilities and functions in the affected area would depend on where the tornado occurred. Injuries or deaths are possible due to wind thrown trees or property damage caused by wind events.

Overall, impacts from high wind and tornado events would likely be negligible, with less than 10 percent of property severely damaged and shutdown of facilities due to loss of power for 24 hours or less.

Previous Occurrences

During the rainy season, the San Luis Obispo planning area is prone to relatively strong thunderstorms, sometimes accompanied by high winds and tornadoes. While tornadoes do occur occasionally, most often they are of F0 intensity. The NCEI Storm Events Database does not record any F1, F2, or F3 events that have occurred in the planning area in the past. Documented incidents of high wind/thunderstorm winds and tornado/funnel cloud events in San Luis Obispo from the NCEI Database are listed in the following tables. Table 5-25 Past High Wind and Tornado Events contains incident descriptions for significant historic events.

Table 5-24 San Luis Obispo County High Wind Events

Date	Magnitude (mph)	Property Damage
February 18, 1993	-	\$50,000
November 26, 1997	62	0
February 2, 1998	78	0
February 5, 1998	61	0
February 7, 1998	61	0
February 19, 1998	50	0
April 3, 1999	55	0
February 11, 2000	52	0
December 17, 2000	48	0
January 10, 2001	55	0
March 4, 2001	65	0
November 24, 2001	55	0
December 7, 2001	52	0
December 19, 2002	55	0
February 25, 2004	47	0
January 7, 2005	58	0
January 2, 2006	56	\$4,000,000
December 7, 2007	51	0
January 4, 2008	65	0
January 27, 2008	54	0
February 23, 2008	65	0
October 13, 2009	68	0
December 13, 2009	50	0
January 18, 2010	52	0
January 20, 2010	52	0
December 11, 2014	50	0
Total		\$4,050,00

Source: NCEI Storm Events Database *NOTE no reports of crop damages, deaths or injuries were recorded



Table 5-25 Past High Wind and Tornado Events

Date of Event	Incident Description
November 26, 1997	A line of severe thunderstorms rumbled across San Luis Obispo and Santa Barbara counties. The storms produced winds gusting up to 71 mph and heavy rain.
February 2, 1998	Hearst Castle, in San Luis Obispo county, reported winds gusting to 90 mph. Elsewhere, winds gusting in excess of 70 mph were reported. Hundreds of trees and power lines were blown down, resulting in numerous power outages. Along with the strong winds, heavy rain drenched the entire area. (refer to Table 5-4 for details on the rain event).
February 19, 1998	Strong thunderstorms moving across San Luis Obispo county produced strong winds in the Templeton area. A spotter reported winds gusting to 58 mph.
May 5, 1998	A small tornado developed over the City of San Luis Obispo. The tornado knocked out power to several hundred homes. Also, four homes were damaged, including a home struck by a fallen cypress tree. (F0)
February 11, 2000	A powerful cold front brought strong winds and heavy snow to parts of Central and Southern California. In Morro Bay, southeast winds, gusting to 60 mph ahead of the front, knocked down numerous trees and power lines.
December 17, 2000	Gusty offshore winds buffeted coastal sections of San Luis Obispo county. In the City of San Luis Obispo, the winds blew out the windows in an unoccupied mobile home, as well as destroyed part of a car port. In Nipomo, a weather spotter reported sustained winds of 35 mph with gusts to 55 mph. Also, the strong winds produced widespread power outages.
January 10, 2001	A strong thunderstorm produced damaging winds in northern San Luis Obispo County. Across southern sections of Atascadero, trees were uprooted as well as damage to fences and decks.
March 4, 2001	Across Central and Southern California, strong southeasterly winds accompanied the storm. Widespread winds between 30 and 50 MPH with stronger gusts were reported from the coastal areas to the mountains. (Refer to Table 5-4 for more details on the heavy rain and flooding that accompanied this event)
November 24, 2001	A strong cold front moved through San Luis Obispo County, producing strong and gusty winds. Weather spotters and the Morro Bay Fire Department reported sustained winds between 35 and 45 mph with gusts as high as 62 mph. Numerous small trees and power lines were blown down between Morro Bay and Atascadero.
December 7, 2001	Gusty northeast winds knocked down power lines and small trees in the community of Morro Bay. Wind speeds were estimated between 25 and 35 mph with local gusts as high as 60 mph.
February 2, 2004	A waterspout, which developed offshore of Oceano Dunes, came onshore as a weak tornado. The weak tornado hit a park ranger in his truck. Fortunately, the park ranger was not injured, and his truck sustained no reportable damage.
January 2, 2006	Strong west to northwest winds, gusting to 65 MPH, affected the community of Cambria in San Luis Obispo County. In total, 84 homes sustained damage with 31 homes sustaining major damage. Estimates of property damage were around \$4 million.
January 4, 2008	In early January, a powerful Pacific storm brought strong winds, heavy rainfall, flash flooding and winter storm conditions to Central and Southern California. The strongest winds were reported across San Luis Obispo and Santa Barbara counties as well as all mountain areas. The winds knocked down trees and power lines, producing numerous power outages. An automated sensor in Atascadero reported sustained winds of 43 mph. A weather spotter in Morro Bay reported a southeasterly wind gust of 75 mph.
January 27, 2008	An observer at Hearst Castle reported southeast winds gusting to 62 mph. The last of several January storms brought high winds and heavy snow to sections of Central and Southern



Date of Event	Incident Description
	California. Across San Luis Obispo and Santa Barbara counties, strong southeasterly winds gusting to 65 mph knocked down trees and power lines across the area.
February 23, 2008	An automated sensor at Atascadero reported southeast winds gusting to 59 mph. An automated sensor at Point Arguello reported southeast winds gusting to 63 mph. In the nearby community of Cambria, numerous trees and power lines were knocked down by the winds. Strong southeast winds gusting to 75 mph were reported in the mountains of San Luis Obispo county. A powerful cold front moved across Central and Southern California in late February. Although the front did not produce significant rainfall, it did bring strong and gusty southeasterly winds to the area. Wind gusts as high as 75 to 86 mph were reported in some areas. The strongest and most widespread winds occurred across the Central Coast as well as the mountains. Numerous trees and power lines were knocked down.
October 13, 2009	From October 12th through October 14th, the first significant storm of the season moved through Southern California. The storm brought heavy rainfall and very gusty southerly winds to the area. Rainfall totals were very impressive, generally ranging between 1 and 3 inches over coastal areas to between 4 and 10 inches in the mountains. Some isolated areas received rainfall amounts over 10 inches over San Luis Obispo and Santa Barbara counties. This storm brought very strong and gusty southerly winds to the area with warning-level winds reported in many areas.
December 13, 2009	A trained weather spotter reported a wind gust of 58 MPH associated with a severe thunderstorm. A powerful winter storm brought heavy rain, flash flooding, gusty winds and severe thunderstorms to Central and Southern California. Rainfall amounts for this storm ranged from 1 to 3 inches over coastal areas to between 3 and 6 inches in the mountain and foothill areas. With such heavy rainfall, there were several reports of flash flooding along with mud and debris flows near the Station Fire burn area. In San Luis Obispo County, a severe thunderstorm producing very strong winds.
January 18, 2010	Strong and gusty south winds associated with an approaching winter storm affected the coast of San Luis Obispo County. A weather spotter in Grover Beach reported south winds gusting to 60 MPH. A series of powerful winter storms affected Central and Southern California between the 18th and 22nd of January. As this series of storms moved across the area, they brought heavy rain, flash flooding, gusty winds, heavy snow and even severe weather to the area.
January 20, 2010	Strong and gusty south winds associated with an approaching winter storm affected the interior valleys of San Luis Obispo county. The Carrizo RAWs sensor reported south winds gusting to 60 MPH while the ASOS at Paso Robles reported sustained south winds of 40 MPH. A trained spotter in the Grover Beach area reported a thunderstorm wind gust of 58 MPH.
February 13 – 14, 2019	February 2019 brought heavy rain and high wind throughout the County. These events resulted in downed power lines and trees. The National Weather Service issued a wind advisory which lasted from February 13th – 14th. On February 13th, 2019, high winds lead to 2,000 PG&E customers to lose power and downed power lines in Arroyo Grande causes roads to be closed. The Atascadero Fire Department reported a 50-foot pine tree fell on two single-story multi-family residences leading to eight people being displaced but none were injured. The fallen tree led to \$400,000 in property damage due to a broken water line (San Luis Obispo Tribune, 2019).

Source: NCEI Storm Events Database, 2014 San Luis Obispo LHMP

The following figures spatially depict the past high wind and tornado events that described in the table above and that have occurred in San Luis Obispo County since 1950.



Figure 5-15 San Luis Obispo County Wind Events 1955 – 2017

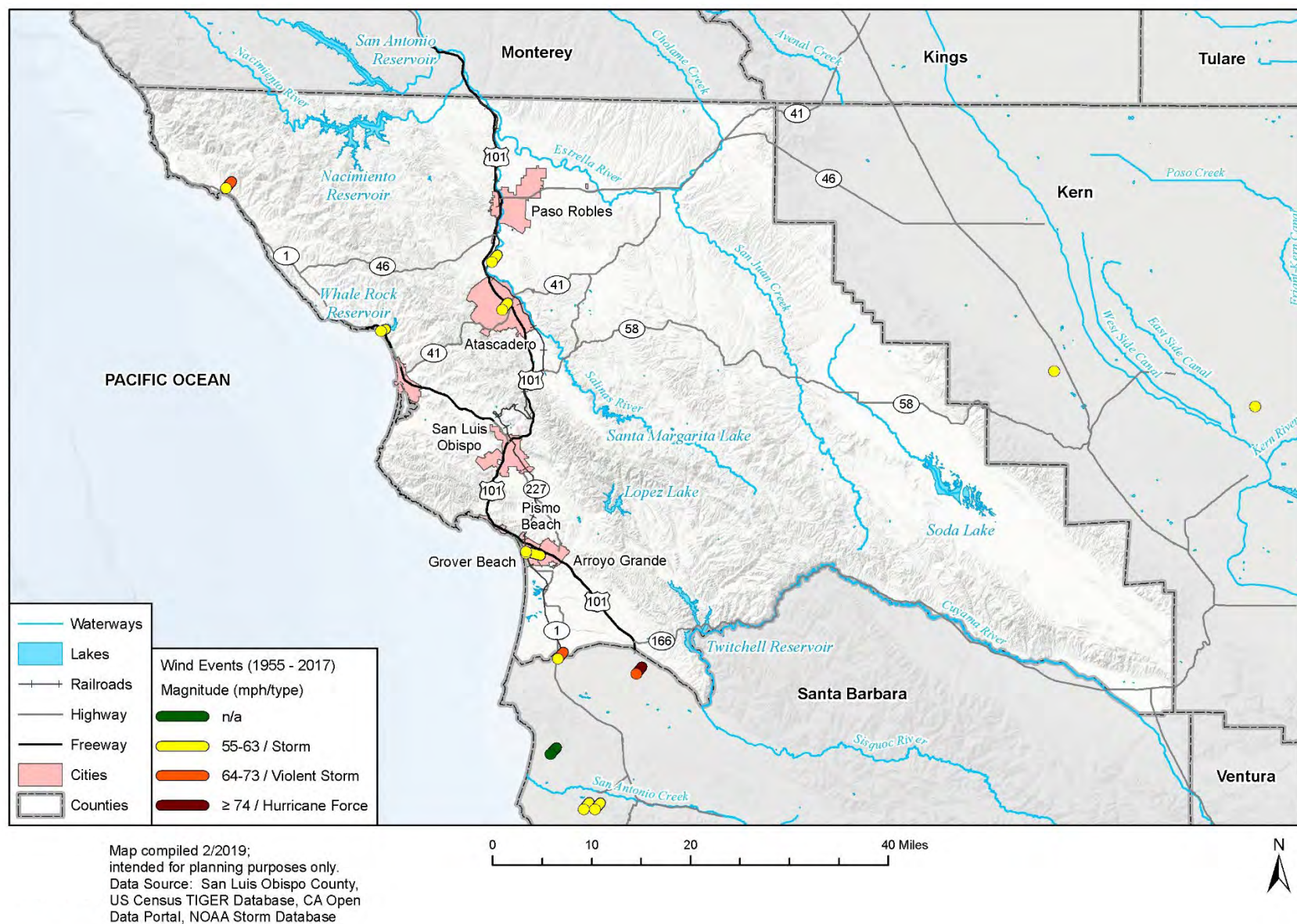
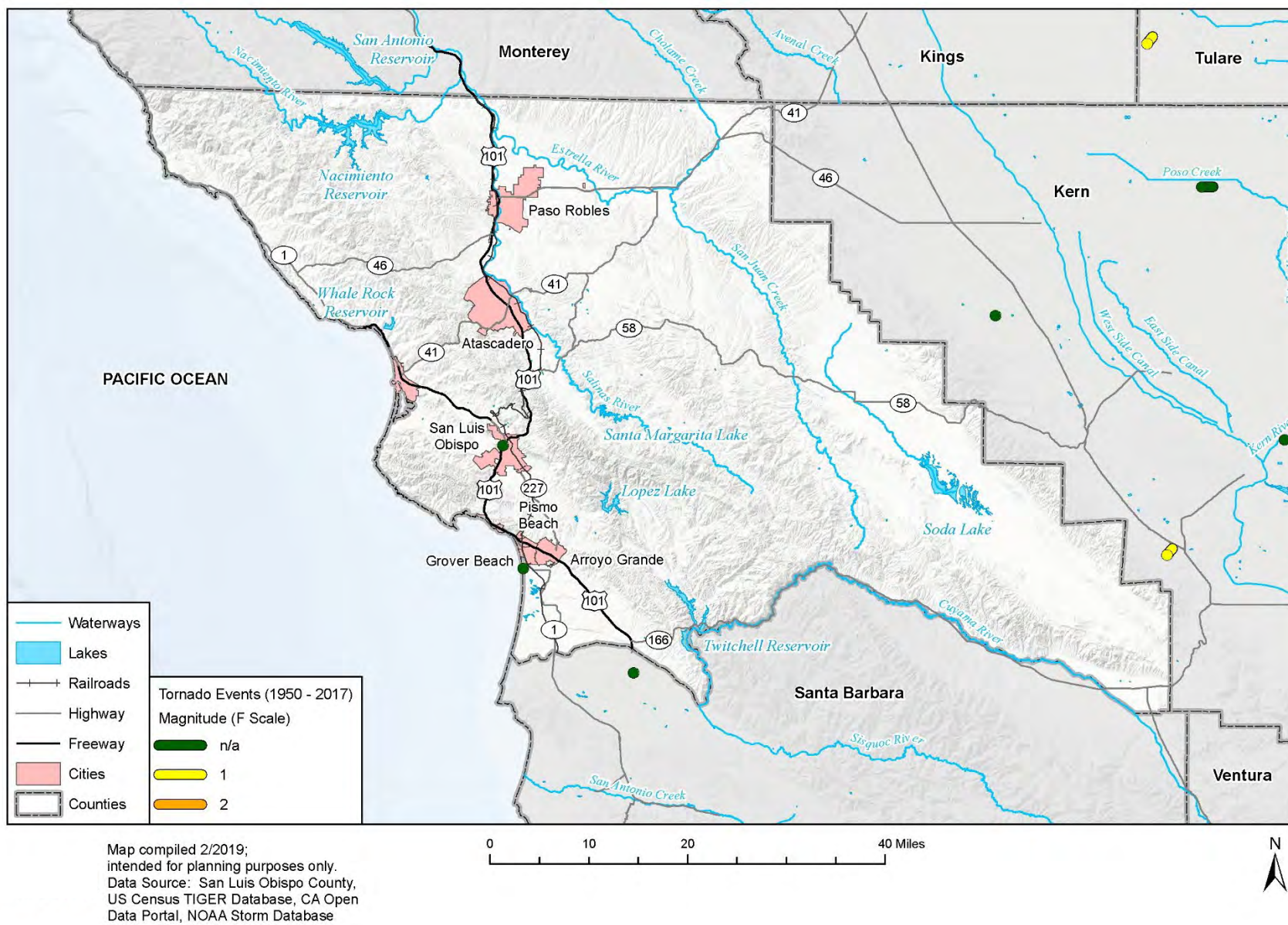


Figure 5-16 San Luis Obispo County Tornado Events 1950 - 2017



Likelihood of Future Occurrences

Likely—Thirty-one high wind and tornado events have occurred in San Luis Obispo County over 68 years of record keeping, which equates to one high wind or tornado event every 2.2 years, on average, and a 46 percent chance of a high wind or tornado event occurring in any given year. Historical wind activity within the planning area indicates that the area will likely continue to experience high wind during thunderstorm events with a potential of the formation of funnel clouds and low intensity tornadoes during adverse weather conditions. The actual risk to the County is dependent on the nature and location of any given thunderstorm or tornado event.

Climate Change Considerations

There presently is not enough data or research to quantify the magnitude of change that climate change may have related to tornado frequency and intensity. NASA's Earth Observatory has conducted studies which aim to understand the interaction between climate change and tornadoes. Based on these studies meteorologists are unsure why some thunderstorms generate tornadoes and others don't, beyond knowing that they require a certain type of wind shear. Tornadoes spawn from approximately one percent of thunderstorms, usually supercell thunderstorms that are in a wind shear environment that promotes rotation. Some studies show a potential for a decrease in wind shear in mid-latitude areas. Because of uncertainty with the influence of climate change on tornadoes, future updates to the mitigation plan should include the latest research on how the tornado hazard frequency and severity could change. The level of significance of this hazard should be revisited over time.

Vulnerability to Severe Weather: High Wind and Tornadoes

Property

General damages are both direct (what the wind event physically destroys) and indirect, which focuses on additional costs, damages and losses attributed to secondary hazards spawned by the event, or due to the damages caused by the wind event. Depending on the magnitude of the wind events as well as the size of the tornado and its path, a tornado is capable of damaging and eventually destroying almost anything. Construction practices and building codes can help maximize the resistance of the structures to damage.

Secondary impacts of damage caused by wind events often result from damage to infrastructure. Downed power and communications transmission lines, coupled with disruptions to transportation, create difficulties in reporting and responding to emergencies. These indirect impacts of a wind event put tremendous strain on a community. In the immediate aftermath, the focus is on emergency services.

Downed trees caused by a wind event are a common occurrence in the county (refer to Table 5-25). Falling trees can cause significant damage to property and put people at risk. Due to multiple years of drought in the county, combined with tree disease and pests, (refer to the Drought section and the section on Agricultural Pest Infestation, Plant Disease, Marine Invasive Species and Tree Mortality), many trees in the area have been impacted making them more susceptible to blow-down during wind events.

GIS was used to estimate the potential for wind damage from fallen trees, assuming that tree mortality areas will be most susceptible. Tree mortality composes just over 13% of the county in area and are found to intersect with a total of 35,780 properties across the county, based on the property centroids defined for all the hazards' parcel analyses. The western half of county is most impacted by tree mortality, with the areas most affected being North County Inland and South County Areas. The following table summarizes

the number of properties in each jurisdiction found within tree mortality high hazard zones (both Tier 1 and 2) based on GIS overlay analysis. Refer to each jurisdictions annex for more details on the types of properties within tree mortality high hazard zones. Additional analysis related to critical facilities and tree mortality high hazard zones is discussed further below.

Table 5-26 Properties Within Tree Mortality High Hazard Zones, by Type and Jurisdiction

Jurisdiction	Property Count	Improved Value
Arroyo Grande	3,253	\$825,279,845
Atascadero	57	\$14,895,750
City of San Luis Obispo	11	\$2,804,138
Grover Beach	4,713	\$866,176,076
Paso Robles	10,306	\$2,556,604,120
Pismo Beach	4,293	\$1,290,261,821
Unincorporated	13,147	\$3,508,212,028
TOTAL	35,780	\$9,064,233,778

Source: CalFire FRAP, 2019; Wood GIS analysis

People

Community members are the most vulnerable to high wind and tornado events. The availability of sheltered locations such as basements, buildings constructed using tornado-resistant materials and methods, and public storm shelters, all reduce the exposure of the population. However, there are also segments of the population that are especially exposed to the indirect impacts of high winds and tornadoes, particularly the loss of electrical power. These populations include the elderly or disabled, especially those with medical needs and treatments dependent on electricity. Nursing homes, community-based residential facilities, and other special needs housing facilities are also vulnerable if electrical outages are prolonged, since backup power generally operates only minimal functions for a short period of time.

Social Vulnerability

Communities that are vulnerable to the impacts of a high wind or tornado event are the same areas of the county with the highest-ranking vulnerable household compositions and overall high ranking of social vulnerability such as Paso Robles and Grover Beach. Based on the SoVI data presented in and discussed in subsection 4.4.1, mitigation efforts to address vulnerability to high wind and tornado should be focused on the communities with the highest social vulnerability rankings.

Critical Facilities and Transportation Infrastructure

Public gathering places including (but not limited to) schools, community centers, shelters, nursing homes and churches, may have increased impacts at certain times of day if struck by a tornado. Other critical and essential facilities, transportation and utility lifelines, and high potential loss facilities such as power plants could also be significantly affected by powerful wind or tornado events, particularly in areas impacted by tree mortality. In the following two tables summarizing critical facilities, GIS overlay analysis was performed to find which of these facilities fall within the high tree mortality areas. Table 5-15 summarizes the facilities found in tree mortality hazard zones by type, while Table 5-16 summarizes the total facilities in these tree mortality areas by jurisdiction. According to this analysis, most critical facilities found at risk are in the unincorporated portions of county, with 47 in Paso Robles and 13 or fewer in Pismo Beach,

Grover Beach, and Arroyo Grande. The three most common facility types at risk are microwave service towers, public schools, and day care facilities. Most of the critical facilities are found in Tier 2 tree mortality areas (190), though 5 facilities are in Tier 1 tree mortality areas.

Table 5-27 Critical Facilities Within Tree Mortality Hazard Zones, by Facility Type

Critical Facility Type	Critical Facility Count
Airports	3
AM Transmission Towers	1
Cellular Towers	4
Colleges / Universities	1
Day Care Facilities	21
Emergency Medical Service Stations	12
Energy Commission Facilities	4
Fire Stations	12
FM Transmission Towers	11
Hospitals	1
Local Law Enforcement	5
Microwave Service Towers	68
Nursing Homes	5
Paging Transmission Towers	1
Power Plant	1
Private Schools	7
Public Schools	26
TV Analog Station Transmitters	3
Urgent Care	3
Water Treatment Facilities	3
Wastewater Treatment Plants	3
Airports	3
TOTAL	195

Source: CalFire FRAP, 2019; HIFLD, San Luis Obispo Planning & Building/GIS Dept., San Luis Obispo County Community Services Districts; Wood GIS analysis

Table 5-28 Critical Facilities Within Tree Mortality Hazard Zones, by Jurisdiction

Jurisdiction	Critical Facility Count
Arroyo Grande	10
Grover Beach	12
Paso Robles	47
Pismo Beach	13
Unincorporated	113
TOTAL	195

Source: CalFire FRAP, 2019; HIFLD, San Luis Obispo Planning & Building/GIS Dept., San Luis Obispo County Community Services Districts; Wood GIS analysis

Historic, Cultural, and Natural Resources

High winds and tornadoes can cause massive damage to the natural environment, uprooting trees and other debris. This is part of a natural process, however, and the environment will return to its original state in time. GIS was used to estimate the potential for wind damage to historic properties from fallen trees,

assuming that tree mortality areas will be most susceptible. The analysis indicates that a total of thirty-three (33) historic properties in San Luis Obispo County are located in high hazard tree mortality zone, five (5) are located in a Tier 1 zone and twenty-eight (28) are located in a Tier 2 hazard zone. Details on the specific properties at risk are found in Appendix E.

Economy

Winds typically don't have long-term impacts on the economy, although wind does have an impact on the agriculture economy in the county. As shown in Table 5-19, wind events have been a leading cause of crop loss in the past three years (2015-2018), resulting in over \$3 million in loss payments from the USDA.

Both winds and tornadoes may impact exposed critical infrastructure such as power lines; depending on the impact and the function, this could cause a short-term economic disruption. The most common problems associated with tornadoes and high winds are loss of utilities. Downed power lines can cause power outages, leaving large parts of the county isolated, and without electricity, water, and communication. Damage may also limit timely emergency response and the number of evacuation routes. Downed electrical lines following a storm can also increase the potential for lethal electrical shock. Damaging winds can also cause wildfires, refer to the Wildfire section for more information on the county's vulnerability to wildfires.

Future Development

As the County continues increase in population, the number of people and housing developments exposed to the hazard increases. Adherence to current building codes, coupled with proper education on building techniques and the use of sturdy building materials, attached foundations, and other structural techniques may minimize the property vulnerabilities. Public shelters at parks and open spaces may help reduce the impacts of tornadoes and high wind events on the recreational populations exposed to storms.

Risk Summary – High Wind and Tornadoes

The overall impact to the community from tornadoes and wind due to severe storms could include:

- San Luis Obispo has experienced 31 wind events in the past 68 years;
- Most damaging wind event occurred on 1/2/2006 and resulted in \$4,000,000 in property damages;
- Over \$3 million in crop indemnities have been paid due to crop loss from excessive wind;
- *Related hazards:* Wildfire, Coastal Storm/Coastal Erosion/Sea Level Rise, Agriculture/Pest Infestation/Plant Disease/Tree Mortality

Table 5-29 Hazard Risk Summary – High Wind and Tornadoes

Jurisdiction	Geographic Area	Probability of Future Occurrence	Magnitude/Severity	Overall Significance
San Luis Obispo County	Significant	Likely	Negligible	Low
City of Arroyo Grande	Significant	Likely	Negligible	Low
City of Atascadero	Extensive	Likely	Limited	Low
City of Grover Beach	Significant	Likely	Negligible	Low
City of Morro Bay	Significant	Highly Likely	Limited	Medium
City of Paso Robles	Significant	Highly Likely	Limited	High
City of Pismo Beach	Significant	Likely	Limited	Low
City of San Luis Obispo	Extensive	Occasional	Limited	Medium
Avila Beach CSD	Significant	Occasional	Negligible	Medium
Ground Squirrel Hollow CSD	Limited	Likely	Negligible	Medium
Heritage Ranch CSD	Extensive	Highly Likely	Critical	High
Los Osos CSD	Significant	Likely	Limited	Medium
Nipomo CSD	Limited	Likely	Negligible	Low
San Miguel CSD	Extensive	Likely	Catastrophic	High
San Simeon CSD	Significant	Likely	Limited	Low
Templeton CSD	Significant	Highly Likely	Limited	High
Cayucos Sanitary District	Extensive	Likely	Critical	High
Port San Luis Harbor District	Extensive	Highly Likely	Limited	Medium
San Luis Obispo FCWCD	Limited	Highly Likely	Negligible	Low
South San Luis Obispo Sanitary District	Significant	Likely	Negligible	Low



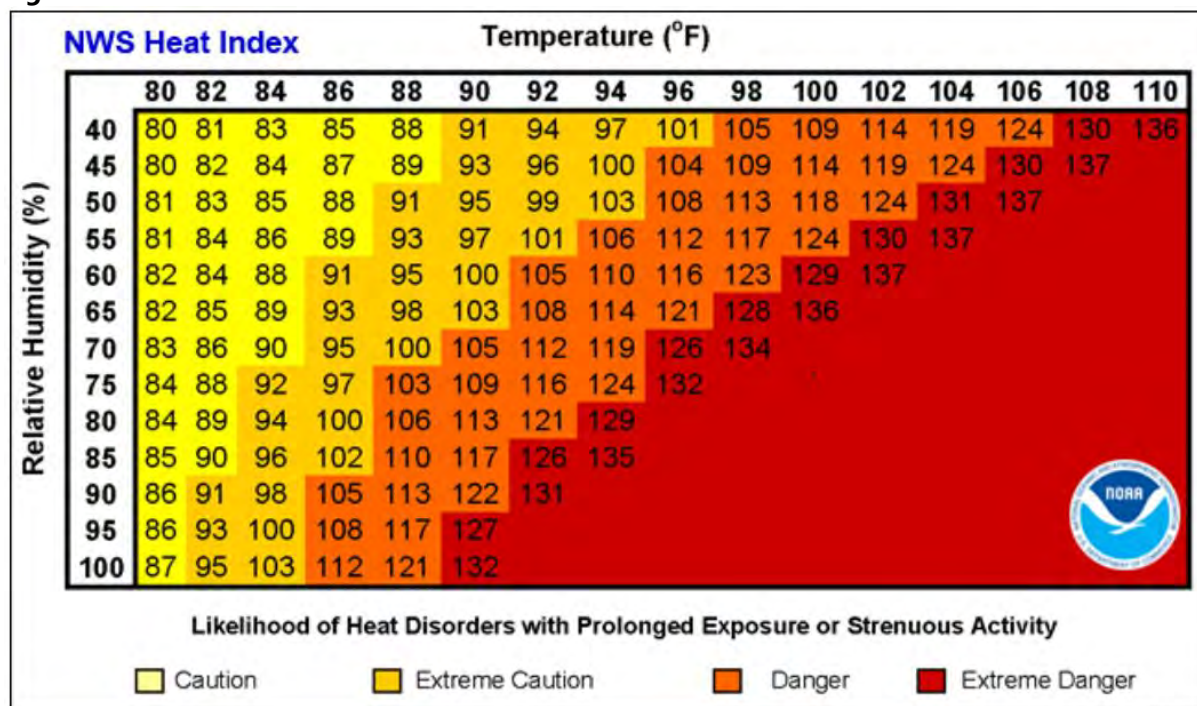
5.3.4 Adverse Weather: Extreme Heat

Hazard/Problem Definition

Extreme heat events can have severe impacts on human health and mortality, natural ecosystems, the agriculture sector and other economic sectors. According to information provided by FEMA, extreme heat is defined as temperatures that hover 10 degrees or more above the average high temperature for the region and last for several weeks. Heat kills by taxing the human body beyond its abilities, usually from heat stroke. In a normal year, about 175 Americans succumb to the demands of summer heat. According to the National Weather Service (NWS), among natural hazards, only the cold of winter—not lightning, hurricanes, tornadoes, floods, or earthquakes—takes a greater toll. As a comparison, in the 40-year period from 1936 through 1975, nearly 20,000 people were killed in the United States by the effects of heat and solar radiation. In the heat wave of 1980, more than 1,250 people died. The 2018 California State Hazard Mitigation Plan (SHMP) notes the 2006 heat wave lead to 650 deaths in a 13-day period (Cal OES 2018) and in the past 15 years heat waves have claimed more lives in California than all other declared disaster events combined (California Climate Adaptation Strategy 2018).

Heat disorders generally have to do with a reduction or collapse of the body's ability to shed heat by circulatory changes and sweating or a chemical (salt) imbalance caused by too much sweating. When heat gain exceeds the level the body can remove, or when the body cannot compensate for fluids and salt lost through perspiration, the temperature of the body's inner core begins to rise, and heat-related illness may develop. The elderly, small children, individuals who work outside, patients with chronic medical conditions, those on prescription medication therapy, and people with weight and alcohol problems are particularly susceptible to heat reactions, especially during heat waves in areas where moderate climate usually prevails. Figure 5-17 illustrates the relationship of temperature and humidity to heat disorders.

Figure 5-17 National Weather Service Heat Index



Source: National Weather Service Note: Since heat index values were devised for shady, light wind conditions, exposure to full sunshine can increase heat index values by up to 15°F. Also, strong winds, particularly with very hot, dry air, can be extremely hazardous.

Geographic Area

All of San Luis Obispo County is at risk of extreme heat events, although different areas of the county may be more at risk than others. Coastal communities on average have lower temperatures compared to communities in the inland areas of the county and may be less at risk to extreme temperatures although potentially less acclimatized to high temperatures if they occur. The North County inland area has the potential for the highest extreme heat days.

Extent (Magnitude/Severity)

The NWS has in place a system to initiate alert procedures (advisories, watches, and warnings) when high temperatures are expected to have a significant impact on public safety. The expected severity of the heat determines which type of alert is issued. The "California OES Contingency Plan for Excessive Heat Emergencies" (2014) indicates that through the use of historical weather and mortality data, the NWS and the California Department of Public Health (CDPH) have identified five major types of climate regions within California to account for climate differences among regions in order to recognize what constitutes an excessive heat event in each of the regions. When temperatures spike for two or more consecutive days without an adequate drop in nighttime temperature to cool the outdoor and indoor environments, there is a significant increase in the risk to vulnerable populations.

Overall, extreme heat impacts would likely be limited in the planning area, with the inland portions of the planning area being most affected. Extreme heat will have an impact on vulnerable populations as well as impact the agricultural sector if the event occurs during certain times of the year.

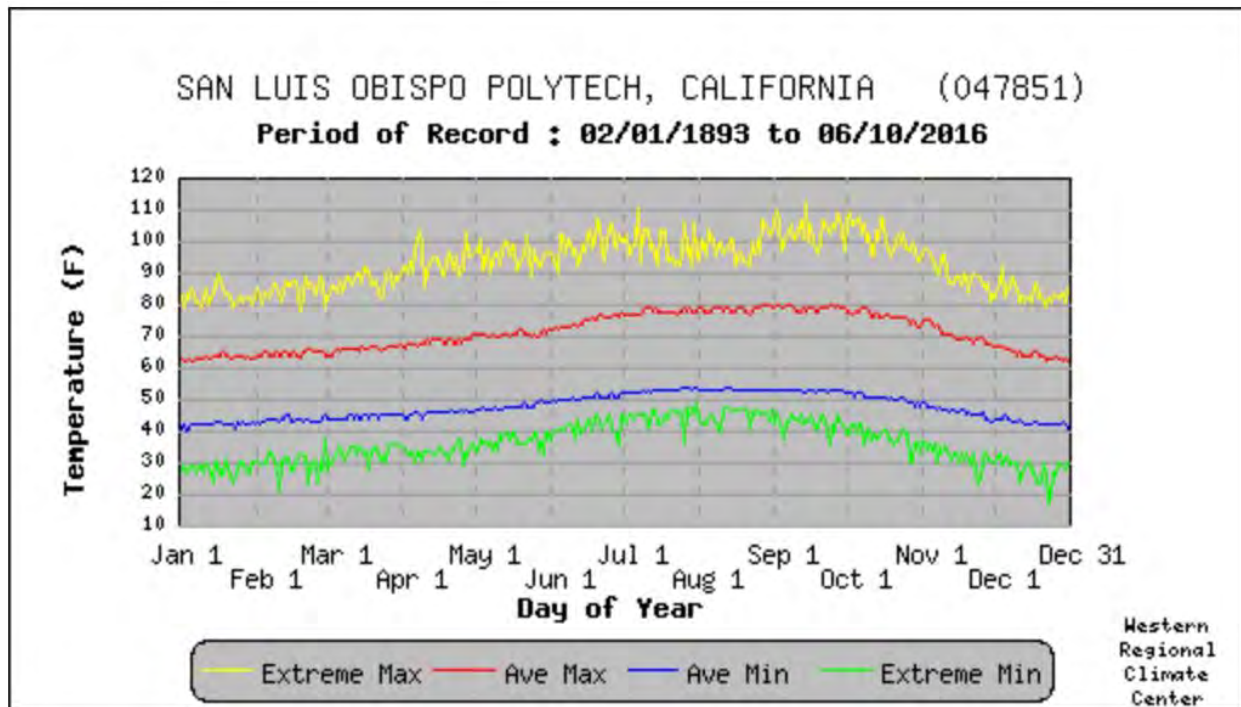
Previous Occurrences

Information from the four representative weather stations introduced in subsection 5.3.1 Adverse Weather: General is summarized below and in Figure 5-18 through Figure 5-21

City of San Luis Obispo Area - San Luis Obispo Polytech (Period of Record 1893 to 2012)

The monthly average maximum temperatures in the warmest months (June through October) range from the low-70s to the mid-70s. Monthly average minimum temperatures from November through May range from the low to high 40s. The highest recorded daily extreme was 112°F on September 14, 1971.

Figure 5-18 San Luis Obispo Poly Tech Daily Temperature Averages and Extremes (Period of Record 1893 -2016)

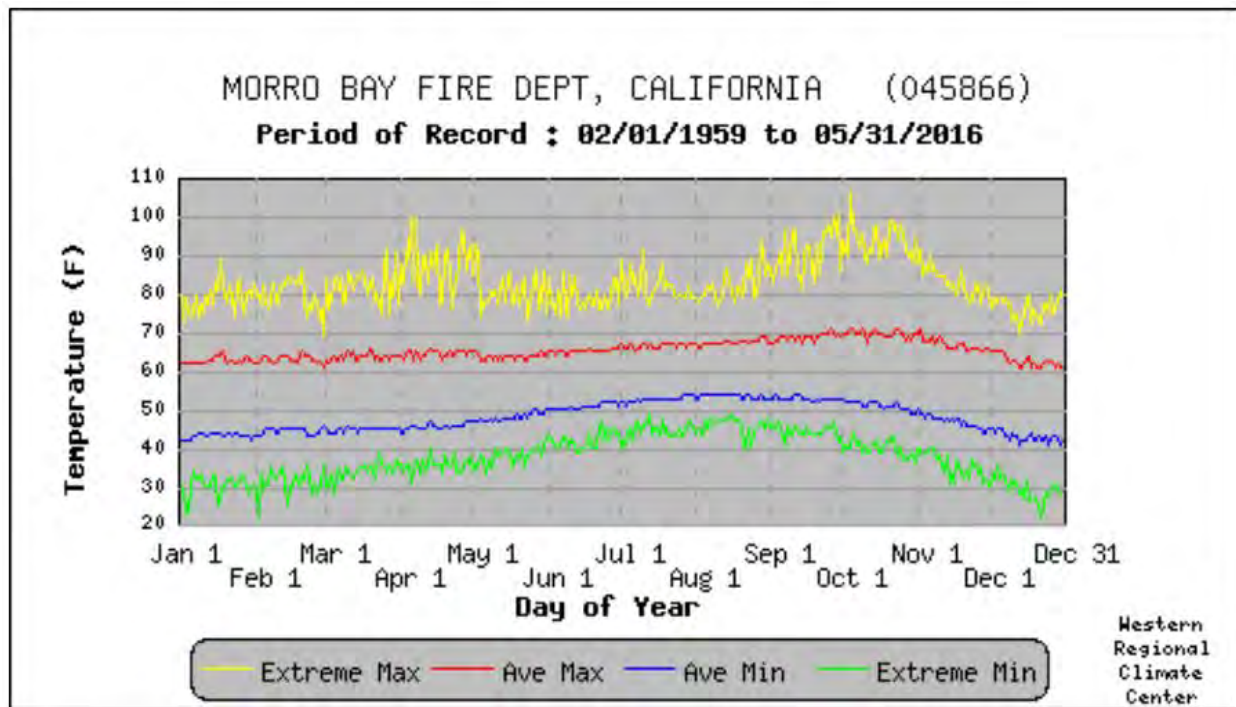


Source: Western Regional Climate Center, www.wrcc.dri.edu/

North County Coastal Area - Morro Bay Fire Department Weather Station (Period of Record 1959 to 2012)

The monthly average maximum temperatures in the warmest months (July through November) range from the mid-60s to the high-60s. Monthly average minimum temperatures from November through June range from the low- to mid-60s. The highest recorded daily extreme was 102°F on September 8, 1984.

Figure 5-19 North County Coastal Area - Daily Temperature Averages and Extremes (Period of Record 1959 -2016)

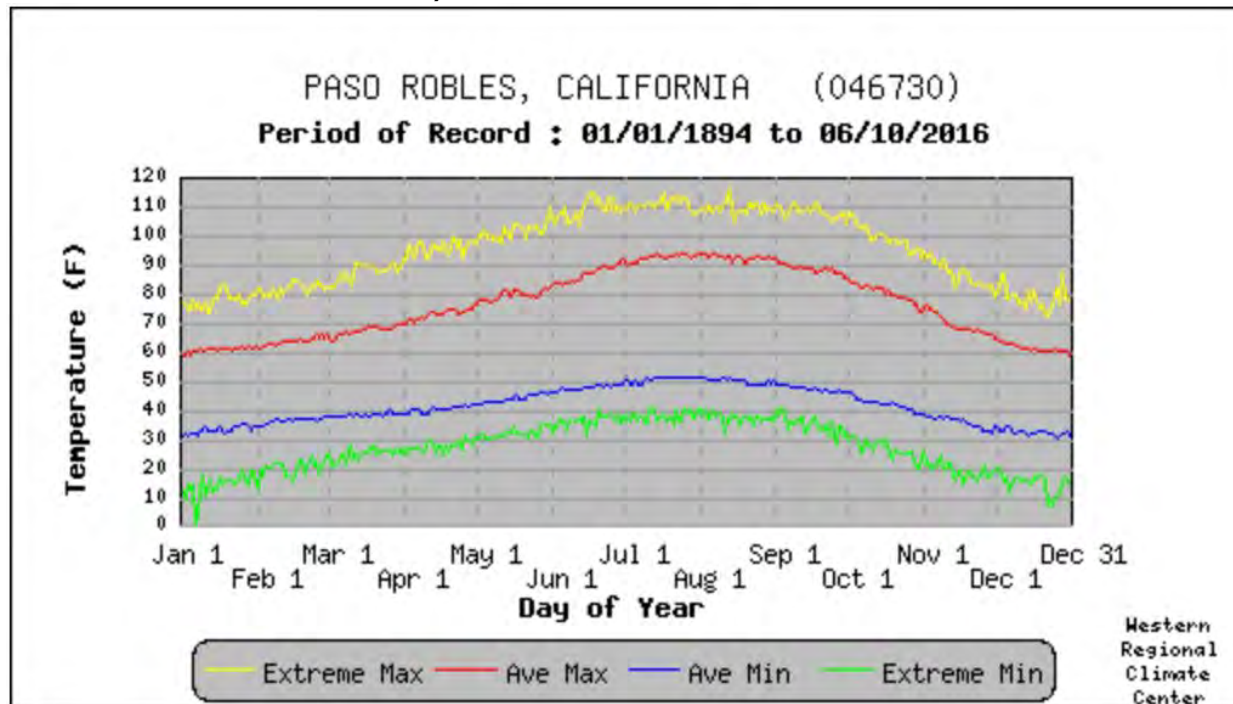


Source: Western Regional Climate Center, www.wrcc.dri.edu/

North County Inland Area - Paso Robles Weather Station (Period of Record 1894 to 2012)

The monthly average maximum temperatures in the warmest months (May through October) range from the high-70s to the low-90s. Monthly average minimum temperatures from October through April range from the low-30s to low-40s. The highest recorded daily extreme was 117°F on August 13, 1933.

Figure 5-20 North County Inland Area - Daily Temperature Averages and Extremes (Period of Record 1894 -2016)

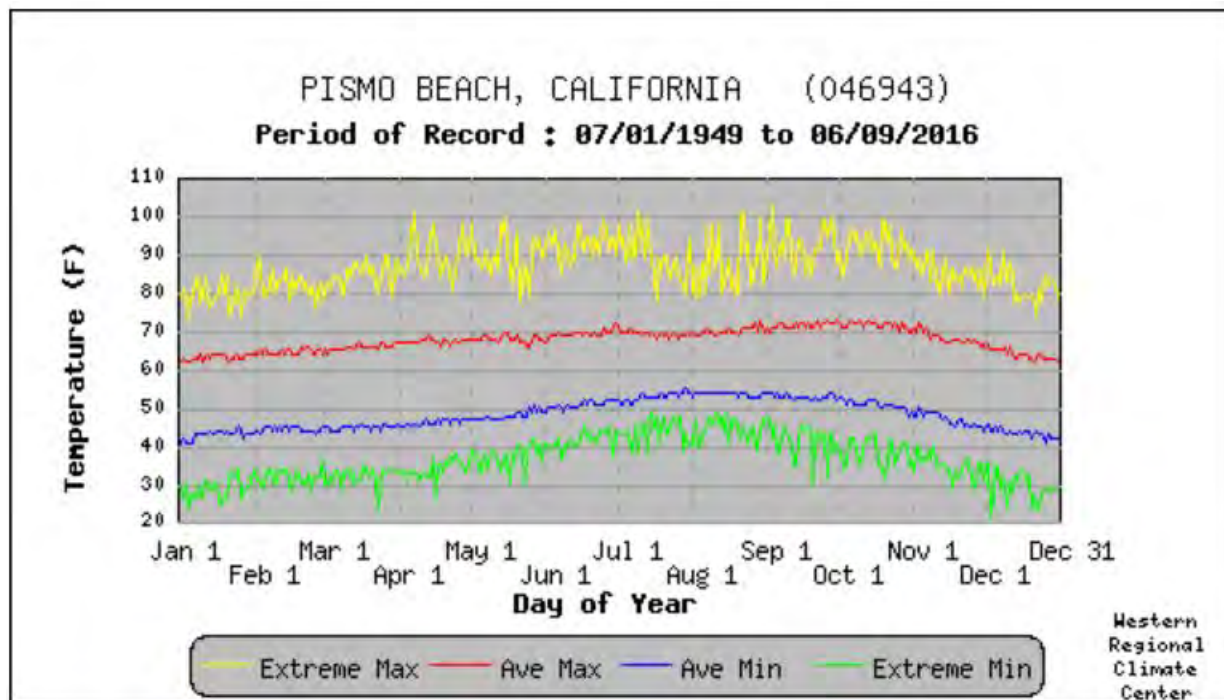


Source: Western Regional Climate Center, www.wrcc.dri.edu/

South County Area – Pismo Beach Weather Station (Period of Record 1949 to 2016)

The monthly average maximum temperatures in the warmest months (May through October) range from the high-60s to the low-70s. Monthly average minimum temperatures from October through April range from the high-40s to low-50s. The highest recorded daily extreme was 108°F on August 28, 1962.

Figure 5-21 South County Area - Daily Temperature Averages and Extremes (Period of Record 1949 -2016)



Source: Western Regional Climate Center, www.wrcc.dri.edu/

Events of Note

According to information obtained from the NCEI Storm Events Database, in the past 68 years (1950-December 2018) there have been 3 heat and excessive heat events in San Luis Obispo County. The following significant events that have occurred within San Luis Obispo County are highlighted below:

July 22, 2006 - The combination of high pressure aloft and above-normal relative humidity resulted in an extended period of excessive heat across San Luis Obispo, Santa Barbara, Ventura and Los Angeles counties. At times, heat index values ranged from 100°F to 119°F.

According to the Central Coast Region Report of California's Fourth Climate Change Assessment, during the 2006 California heat wave the state experienced an overall excess number of emergency room (ER) visits and hospitalizations. The Central Coast region (San Luis Obispo, Santa Barbara, Monterey, San Benito, and Santa Cruz) contributed far more to both ER visits (28 percent) and hospitalizations (47 percent) than what would have been expected (18 percent) based on overall state populations. The report attributes the high number of ER visits and hospitalizations on the regions typically cooler climate and residents lack of acclimatization to the extreme heat.

September 3, 2007 - The combination of above normal temperatures and relative humidity produced excessive heat conditions across the mountains and valley of San Luis Obispo county. Heat index values between 105°F and 112°F were reported. The heat wave which started at the end of August continued into the first few days of September. The combination of above normal temperatures and relative humidity continued to produce excessive heat conditions across sections of Southern California.

June 20, 2008 - The combination of strong high pressure centered over Arizona and weak offshore flow generated extreme heat conditions across Central and Southern California. Across many sections of the area, afternoon temperatures climbed to between 100 and 114 degrees which set numerous high temperature records. The extreme heat resulted in several power outages due to excessive electrical use. The automated sensor at Paso Robles reported a high temperature of 107 with a heat index of 105 degrees.

Probability of Future Occurrences

Occasional—Temperature extremes are likely to continue to occur annually in the San Luis Obispo County planning area.

Climate Change Considerations

According to the Central Coast Region Report of California's Fourth Climate Change Assessment report, both average high and average minimum temperatures are expected to increase, with the greatest increases in the inland regions of the Central Coast. Due to the rising temperatures heat waves are likely to become more frequent, which will have direct impacts on human health in terms of heat related illness. San Luis Obispo's large farming and viticulture production which employs 1,000s of outdoor laborers will be vulnerable to the rising temperatures and most at risk for heat related illnesses. Residents on the coastal regions of County will also be vulnerable to rising temperatures, as many of the homes of the coast do not have air conditioning units as there was less of a need in the past and may be less prepared compared to the inland region of the county to adapt to extreme heat events.

Cascading impacts include increased stress on water quantity and quality, degraded air quality, and increased potential for more severe or catastrophic natural events such as heavy rain, droughts, and wildfire. Another cascading impact includes increased duration and intensity of wildfires with warmer temperatures. According to the 2013 document, "Preparing California for the Extreme Heat", Cal-Adapt projects that throughout California urban and rural population centers will experience an average of 40 to 53 extreme heat days by 2050 and an average of 40 days by 2099; compared to a historical average of 4 per year (CalAdapt 2013).

Extreme heat has also been shown to accelerate wear and tear on the natural gas system and electrical infrastructure (California Natural Resources Agency 2018a). Projected increases in summer demand associated with rising temperatures may increase risks to energy infrastructure and may exceed the capacity of existing substations and distribution line infrastructure and systems.

Vulnerability: Extreme Heat

General Property

Recent research indicates that the impact of extreme heat, particularly on populations, has been historically under-represented. The risks of extreme heat are often profiled as part of larger hazards, such as drought or wildfire. However, as temperature variances may occur outside of larger hazards or outside of the expected seasons but still incur large costs, it is important to examine them as stand-alone hazards. Extreme heat may overload demands for electricity to run air conditioners in homes and businesses during prolonged periods of exposure and presents health concerns to individuals outside in the temperatures. While extreme heat rarely damages buildings, it can cause infrastructure damage to roads.

People

Traditionally, the very young and very old are considered at higher risk to the effects of extreme heat, but any populations outdoors during periods of extreme temperatures are exposed, including otherwise young and healthy adults and homeless populations. While everyone is vulnerable to extreme heat incidents, some populations are more vulnerable than others. Extreme heat poses the greatest danger for San Luis Obispo's thousands of outdoor laborers who support the County's agriculture economy who are exposed to extreme temperatures and at higher risk of heat related illnesses than other populations of the county. Climate change projections of rising temperatures in the region also pose a risk to the County's coastal population who is more accustomed to cooler temperatures. and therefore, may have never needed air conditioning in their homes. This could result in some populations being unprepared for an extreme heat event.

The elderly, children, people in poor physical health, and the homeless are also vulnerable to exposure. Arguably, the young-and-otherwise-healthy demographic may also experience a higher vulnerability of exposure, due to the increased likelihood that they will be out in temperatures of extreme heat, whether due to commuting for work or school, conducting property maintenance such as lawn care, or for recreational reasons.

Social Vulnerability

The North County inland area has the potential for the highest extreme heat days. Based on the SoVI data presented and discussed in subsection 4.4.1, within this region, the communities of Paso Robles San Miguel, and Shandon have the highest social vulnerability.

Critical Facilities and Infrastructure

Extreme heat can affect road infrastructure, damaging and buckling road surfaces. Other direct impacts to critical infrastructure includes power line sagging and power surges. Critical infrastructure that relies on public utility systems that could be overloaded may result in impacts during extreme heat events. Peak demand exceeding the local utility's capacity for supply can lead to blackout or brownout conditions. The loss of utilities or power outages during extreme heat events could also result in adverse secondary impacts to sensitive populations. Electrical power outages may impact response capabilities or care capabilities for hospitals and clinics.

Economy

Extreme heat impacts on the economy may be more indirect compared to other hazards. San Luis Obispo has a large agriculture economy. As noted previously outdoor laborers who are exposed to extreme heat and at a high risk of heat related illnesses, and a long-term heat event could cause work interruptions. Crops are also impacted by heat events and could have an impact on the overall economy in the county. According to the USDA RMA Indemnity Report, since 2015 there have been 65 heat events that have resulted in \$3,569,208 in crop losses in the county.

Historic, Cultural, and Natural Resources

Extreme heat may cause temporary drought-like conditions. For example, several weeks of extreme heat increases evapotranspiration and reduces moisture content in vegetation, leading to higher wildfire vulnerability for that time period even if the rest of the season is relatively moist.

Future Development

Since structures are not usually directly impacted by severe temperature fluctuations, continued development is less impacted by this hazard than others in the plan. However, pre-emptive measures such as construction of green buildings that require less energy to heat and cool, use of good insulation on pipes and electric wirings, and smart construction of walkways, parking structures, and pedestrian zones that minimize exposure to severe temperatures may help increase the overall durability of the buildings and the community to the variations. Continued development also implies continued population growth, which raises the number of individuals potentially exposed to variations. Public education efforts should continue to help the population understand the risks and vulnerabilities of outdoor activities, property maintenance, and regular exposures during periods of extreme heat.

Risk Summary – Extreme Heat

- There have been three notable extreme heat events in past 68 years in San Luis Obispo County;
- The inland area of the eastern County is more likely to experience an extreme heat event
- Coastal areas are potentially vulnerable to extreme heat due to lack of acclimatization to high temperatures and less air conditioning;
- Highest recorded temperature for the San Luis Obispo Area is 112°F on Sep. 14, 1971
- Highest recorded temperatures for North County Coastal Area is 102°F on Sept. 14, 1984
- Highest recorded temperatures for Inland Area is 117°F on Aug. 13, 1933
- High recorded temperatures for South County Area is 108°F on Aug. 28, 1962;
- Extreme heat can have considerable impacts on human health, the natural environment and the economy;
- The County's agriculture economy is at risk of extreme heat from outdoor laborers being vulnerable to heat illnesses as well as crop losses due to heat;
- The very young, the very old, people with poor physical health and the homeless are more susceptible to the impacts of extreme temperatures;
- Climate change is projected to increase temperatures in the Central Coast region of the State.
- *Related hazards:* Drought, Land Subsidence, Wildfire, Agriculture/Pest Infestation/Plant Disease/Tree Mortality,

Table 5-30 Hazard Risk Summary – Extreme Heat

Jurisdiction	Geographic Area	Probability of Future Occurrence	Magnitude/Severity	Overall Significance
San Luis Obispo County	Extensive	Occasional	Negligible	Low
City of Arroyo Grande	Extensive	Occasional	Negligible	Low
City of Atascadero	Extensive	Occasional	Negligible	Low
City of Grover Beach	Extensive	Occasional	Negligible	Low
City of Morro Bay	Significant	Highly Likely	Limited	Medium
City of Paso Robles	Extensive	Highly Likely	Limited	High
City of Pismo Beach	Significant	Likely	Limited	Low
City of San Luis Obispo	Extensive	Occasional	Negligible	Low
Avila Beach CSD	Significant	Occasional	Negligible	Medium
Ground Squirrel Hollow CSD	Limited	Likely	Negligible	Medium
Heritage Ranch CSD	Extensive	Highly Likely	Critical	High
Los Osos CSD	Significant	Likely	Limited	Medium
Nipomo CSD	Limited	Likely	Negligible	Low
San Miguel CSD	Extensive	Likely	Catastrophic	High
San Simeon CSD	Significant	Likely	Limited	Low
Templeton CSD	Significant	Highly Likely	Limited	High
Cayucos Sanitary District	Extensive	Likely	Critical	High
Port San Luis Harbor District	Extensive	Highly Likely	Limited	Medium
San Luis Obispo FCWCD	Extensive	Occasional	Negligible	Low
South San Luis Obispo Sanitary District	Extensive	Occasional	Negligible	Low



5.3.5 Agricultural Pest Infestation, Plant Disease, Marine Invasive Species and Tree Mortality

Hazard/Problem Definition

Agricultural pests and pathogens (insects, fungi, bacteria, viruses and invasive plants) cause injury or destruction to crops or livestock. From exotic fruit flies to noxious weeds, California's agriculture can be impacted by a wide variety of invasive pests. These pests pose significant threats to the state's agricultural crops, economy, food supply and native habitat. The number of invasive pests and pathogens newly detected in California and the rest of the United States has increased at alarming rates in recent years, and that trend is projected to continue into the future.

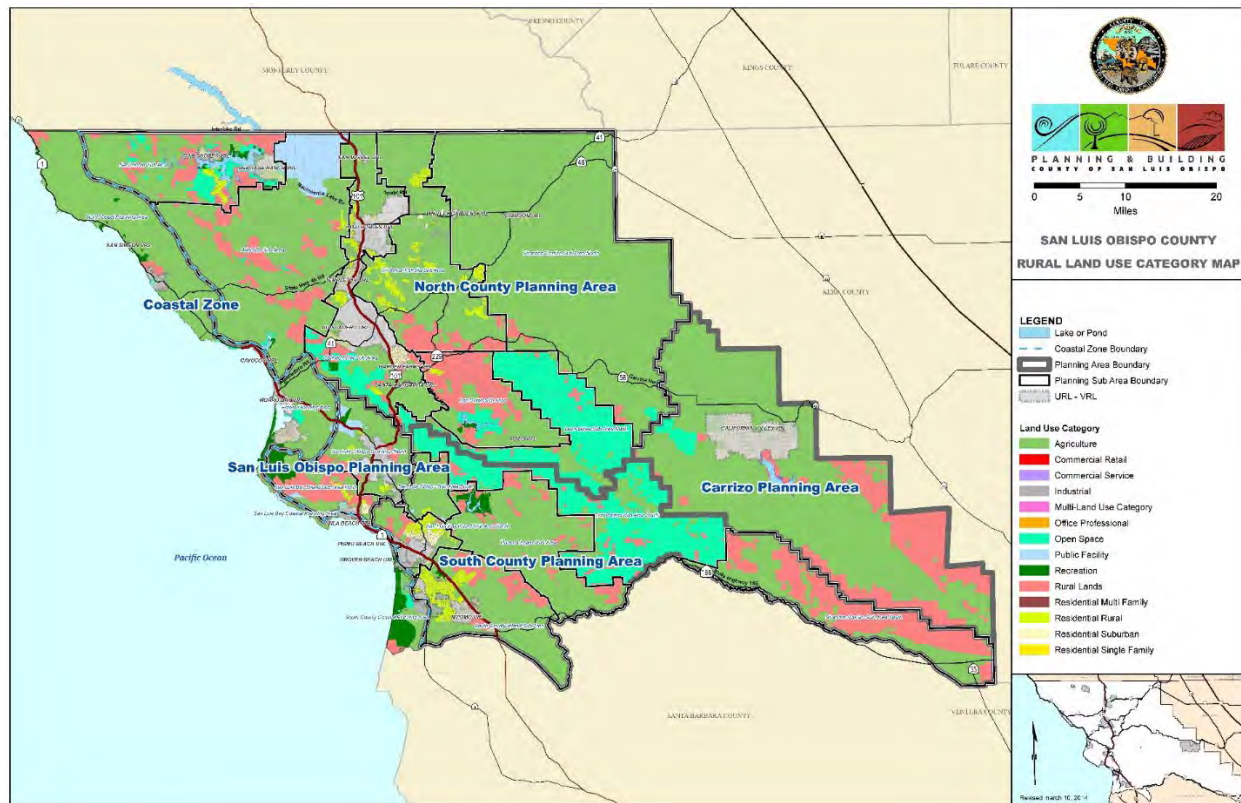
Invasive species are not just contained to dry land. Marine invasive species can take over enclosed water ecosystems, disrupting delicate ecological structure and displacing entire native species. Marine invasive species can also foul pipes of hydroelectrical facilities, water works, and other industrial facilities, impairing facility functions.

A specific concern of the county is tree vulnerability and mortality. Over 100 million trees have died and more continue to die due to many years of drought that have weakened trees, and left millions of acres of forestland highly susceptible to insect attacks. The drought stress is exacerbated in forests with too many trees competing for limited resources, especially water. Forest pests (insects and diseases) annually destroy ten times the volume of timber lost to due to forest fires. Native bark beetles took hold in Southern California forests and caused unprecedented tree mortality. Pitch Canker disease has attacked Monterey Pines along the central coast. Sudden Oak Death has been found in 14 counties in California and has killed thousands of oaks. Tree losses due to drought stresses and bark beetle attacks are expected to increase until precipitation levels return to normal or above normal for one to multiple years.

Geographic Area

Agricultural pests usually occur in rural areas used for the growing of crops, though tree mortality can affect urban and rural forested areas; marine invasive species usually occur in contained aquamarine areas, including rivers, creeks, ponds and lakes. In San Luis Obispo County, agriculture lands are interspersed across the county but largely focused in the North County region. Figure 5-22 shows land use across the county; agricultural lands are shown in light green.

Figure 5-22 San Luis Obispo – County Land Use



During discussions with the HMPC, it was noted that while most agricultural pests occur in rural areas, the initial introduction of those pests is often due to human/vehicle movement and occurs in more urbanized areas. Often, especially in the case of insect pests, the species will first become established in a residential or urban area, and then move into croplands.

Marine invasive species are a threat to marine areas with a relatively enclosed, self-contained ecosystem. Figure 5-22 shows main bodies of water and waterways in the county; specific points of interest include Nacimiento Reservoir, Soda Lake, Twitchell Reservoir, Santa Margarita Lake and Whale Rock Reservoir. The Dam Incident section has more information on reservoirs and other bodies of water.

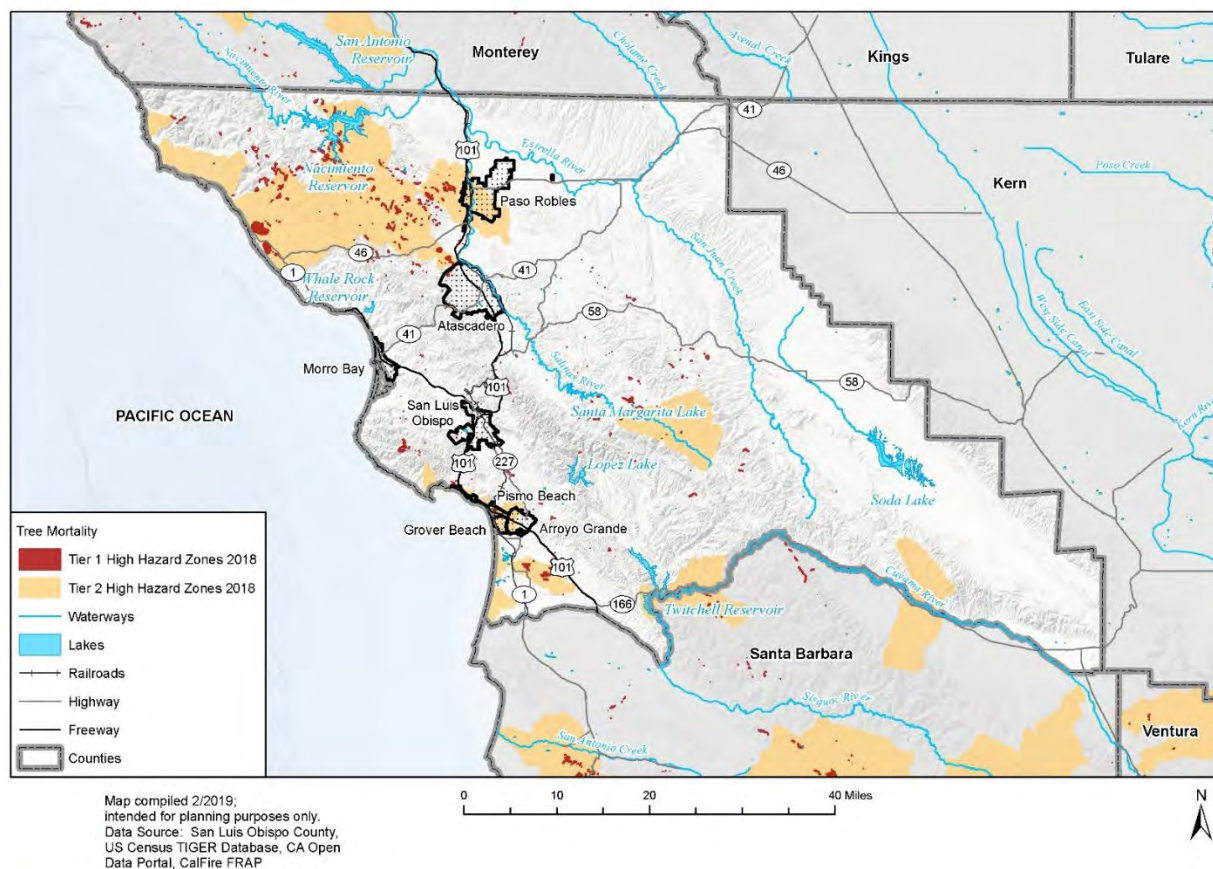
Tree Mortality: Tree mortality was identified as an additional drought impact of significance to the county during the 2019 update. Tree mortality is a cascading impact which also affects (or worsens) other hazards such as wildfire, agricultural and biological hazards, and wind. In recent years, due to the multi-year drought throughout the planning area and state-wide, a vast number of trees have been (and continue to be) impacted within San Luis Obispo County foothill and mountain communities and beyond. Standing dead trees could fall and pose a risk to people, buildings, power lines, roads and other infrastructure. In addition, drought-impacted trees become susceptible to diseases and insect infestations (bark beetle) further adding to the risk of tree mortality and related potential impacts.

California established the California Tree Mortality Task Force in October 2015. As part of the work of the Task Force, areas of tree mortality were identified and mapped to show areas that pose the greatest potential to harm people and/or property. These areas, known as High Hazard Zones, are the areas prioritized for tree removal, and are separated into Tiers. Tier I High Hazard Zones are areas where

mortality and the asset to be protected (utilities, roads, recreation sites etc.) directly coincide with mortality identified by the USFS. Tier 2 HHZ is based on watersheds and are intended to focus on ecosystem health and identify watersheds where there is both the greatest amount of ecological assets to be protected, as well as the greatest threat.

Figure 5-23 shows High Hazard Zones in the county, as well as areas of tree mortality and community boundaries. Paso Robles, Atascadero, Pismo Beach, Arroyo Grande, Grover Beach and the unincorporated county are all impacted by Tier 2 High Hazard Zones; Tier I High Hazard Zones are found in the unincorporated county, as well as Atascadero.

Figure 5-23 San Luis Obispo – Tree Mortality and High Hazard Zones



Extent (Magnitude/Severity)

2017 San Luis Obispo County annual crop statistics released by the San Luis Obispo County Department of Agriculture/Weights and Measures show that agricultural assets in the county have a gross valuation of \$924,698,000. The top twenty value crops based on county data shown in the following table.

Figure 5-24 San Luis Obispo County – 2017 Top Twenty Value Crops

Crop	Value
Wine Grapes (All)	\$267,662,000
Strawberries	\$228,169,000
Cattle and Calves	\$42,241,000
Broccoli	\$42,996,000

Crop	Value
Vegetable Transplants	\$33,119,000
Avocados	\$27,295,000
Cut Flowers	\$27,165,000
Cauliflower	\$23,253,000
Head Lettuce	\$17,477,000
Lemons	\$16,016,000
Leaf Lettuce	\$11,161,000
Outdoor Ornamentals	\$9,320,000
Celery	\$8,405,000
Rangeland Grazed	\$8,096,000
Grain Hay	\$2,447,000
Alfalfa Hay	\$2,421,000
Barley	\$1,761,000
English Walnuts	\$1,264,000
Squash	\$1,027,000
Peas	\$532,000

Source: San Luis Obispo County Department of Agriculture/Weights and Measures

Different pests can impact different crops in different ways; while there is no scale to define the extent of an infestation, a pest could have a major economic impact on the value of infested crops.

According to Cal-IPC, invasive plants cost California \$82 million every year in control, monitoring and outreach; estimated actual impacts can reach into the billions.

Previous Occurrences

San Luis Obispo County has a demonstrated vulnerability to pest infestation including the Vine Mealybug, Glassy-winged sharpshooter and Pine Pitch Canker.

Vine Mealybug: The Vine Mealybug (VMB), *Planococcus ficus*, is an exotic pest in California that was first found in San Luis Obispo County in 1991. It causes an enormous amount of damage, is very difficult and costly to treat, and can lead to total crop loss without the diligent use of insecticide treatment. Although it has only been found on grapes so far in California, alternate hosts include avocados, citrus and other crops. It is currently seen in most grape growing counties of California including vineyards in San Luis Obispo, Santa Barbara and Monterey counties.

The Vine Mealybug has 5 to 7 generations per year, enabling populations to grow very rapidly. Unlike other mealybugs, all life stages of the VMB can be present year-round on a vine. During winter months, eggs, crawlers, nymphs, and adults are found under bark, within developing buds, and on roots.

Prevention: The female VMB can easily be transported through contaminated nursery stock, equipment, personnel as well as birds and other wildlife. Vineyard managers need to employ strict biosecurity and sanitation in the vineyard. Best Management Practices (BMP) in the vineyard and at the wineries that process the grapes can reduce the spread of VMB. Monitoring vineyards for the presence of VMB by

detection trapping is essential to the early detection and successful treatment of the pest. It is unlikely that VMB will be eradicated from most vineyards. With early detection and vigilant treatment VMB populations can be kept in check.

Glassy-winged sharpshooter (GWSS): The Glassy-winged sharpshooter (*Homalodisca coagulata*) is an insect that poses a significant hazard to California agriculture. When feeding, it can transmit Pierce's disease, caused by the bacterium, *Xylella fastidiosa*, to grapevines, and other diseases to almond trees, alfalfa, citrus and oleanders. First detected in California in 1994, this insect has spread throughout Southern California and into the southern San Joaquin Valley. The first major infestation in California occurred in 1999 in Temecula, where more than 300 acres of vineyards were destroyed.

Figure 5-25 Glassy-winged Sharpshooter



The Glassy-winged sharpshooter is considered a serious threat to San Luis Obispo County's multimillion-dollar wine industry because it spreads bacteria that cause a lethal disease to grape plants. It is also a nuisance to homeowners because it deposits a sticky residue on plant.

Localized infestations have been found in San Luis Obispo County, although these are believed to be eradicated. A single glassy-winged sharpshooter was found in a trap in July 2017; additional inspection and survey found no additional sharpshooters in the area, and no signs of an established breeding population were detected.

Prevention: The San Luis Obispo County Agricultural Commissioner's Office (SLOCACO) is in partnership with the California Department of Food and Agriculture (CDFA), the United States Department of Agriculture, the University of California, and other county Agricultural Commissioner's offices to collaborate with the Pierce's Disease Control Program (PDCP). The PDCP works to minimize the statewide impact of Pierce's Disease and the Glassy-winged sharpshooter. The strategy is to slow or stop the spread of GWSS while both short and long-term solutions to Pierce's disease are developed.

This strategy relies on the following five elements:

- Containing the Spread
- Statewide Survey and Detection
- Rapid Response
- Outreach
- Research

The bulk of the SLOCACO's efforts have been in excluding the sharpshooter from San Luis Obispo County and implementing a detection program most heavily weighted in nursery and urban settings. The

exclusion efforts for the program consist mainly of inspecting incoming plant shipments from infested portions of the state bound for wholesale and retail nurseries throughout San Luis Obispo County.

The detection efforts for the program consist mainly of deploying insect traps in nursery and urban residential areas. Monitoring of the traps is performed every two weeks along with periodic relocation of the traps.

Pine Pitch Canker: A condition that is threatening the health of the Monterey pine trees in the Cambria area is the Pine Pitch Canker (*Fusarium subglutinans pini*). This disease, native to Mexico and the southeastern United States, was first found in California in 1986. Since then, it has been found in 16 counties, and is spread by insects, the use of contaminated tools, and the transport of infected wood. The Pine Pitch Canker is considered to be a significant threat to the continued survival of the Monterey Pine ecosystem. Large native stands of the trees are now only found in the Ano Nuevo, Monterey, and Cambria areas. If a tree becomes infected with the Pine Pitch Canker, the disease can spread quickly, and can result in the rapid death of the tree. If an infected or dead tree is not properly removed, it not only becomes a threat to spread the disease, but can also result in a safety threat, as a large dead tree is a fire hazard as well as presenting the potential to become uprooted and to fall during a storm. This pathogen is also a serious concern to the commercial nursery industry.

Prevention: Preventative measures consist of pest detection, exclusion and eradication in production nursery settings, and informing the public and nursery industry about the dangers of moving infected plant material out of infested areas.

Light Brown Apple Moth: The Light Brown Apple Moth (*Epiphyas postvittana*), is native to Australia and is found in New Zealand, the United Kingdom and Hawaii. The range of host plants is broad with more than two-thousand plant species known to be susceptible to attack by this pest, and more than 250 crops. It threatens California's environment—including cypress and oak trees—by destroying, stunting or deforming young seedlings and damaging new growth in the forest canopy. The moth also feeds on host plants and damages or spoils the appearance of ornamental plants, citrus, grapes, and deciduous fruit tree crops. In 2010, nine coastal California counties were under quarantine for the presence of this pest. State and federal agriculture officials are currently developing sterile insect technology to combat the infestation. In 2015, light brown apple moths were identified in the city of San Luis Obispo for the first time.

Prevention: Preventative measures consist of pest detection, exclusion and eradication.

Figure 5-26 **Light Brown Apple Moth**



During the review process, a Hazard Mitigation Planning Committee member representing the San Luis Obispo County Department of Agriculture noted that as of 2019, the Light Brown Apple Moth is established across most of coastal California, and that efforts are underway to de-classify this species as an official rated pest insect. While the Light Brown Apple Moth remains in the 2019 Hazard Mitigation Plan, future versions may remove this pest from consideration.

Asian Citrus Psyllid/Citrus Greening Disease (Huanglongbing): The Asian citrus psyllid (ACP) is a pest that acts as a carrier or vector spreading “huanglongbing”, a devastating disease of citrus trees. This bacterial disease is transmitted to health trees by the psyllid after it feeds on infected plant tissue.

ACP was first identified in San Luis Obispo County in March 2014 in Arroyo Grande. In response to the identification, the San Luis Obispo Agriculture Department implemented a quarantine in a five-mile radius from the site. The quarantine required growers and nursery owners to use pesticides to eradicate any ACP before moving fruit or trees out of the area. Numbers of the ACP identified in San Luis Obispo County have been steadily on the rise; according to the California Department of Agriculture, more than 100 invasive insects were found in southern San Luis Obispo County (specifically in the Nipomo area) in 2018; this was triple the number found in 2017. The County has a proactive detection program, with approximately 2,000 traps set up around the county, mostly in the South County.

Symptoms and Impact: ACP damages plants directly through its feeding activities; new shoot growth that is heavily infested by psyllids does not expand and develop normally and is more susceptible to breaking off. While direct damage is serious, there is even greater concern that the psyllid is an efficient vector of the bacterium that causes the economically devastating disease citrus greening, or huanglongbing.

Prevention: The California Department of Food and Agriculture tracks the presence of pests and disease and establishes quarantines to help protect California citrus trees.

Invasive Shot Hole Borer/Goldspotted Oak Borer: The goldspotted oak borer (GSOB) is an invasive pest contributing to the ongoing oak tree mortality; it is a concern for both native oaks and oak woodlands. The invasive shothole borer are potential pests for agriculture, native trees and urban forests. The insects can attack over 110 tree species, including sycamore, cottonwood, alder, willows and boxelders.

As of March 2019, these insects have not been located anywhere in San Luis Obispo County, but have been found in surrounding areas. The University of California Cooperative Extension notes isolated areas of infestation in Riverside, Orange and Los Angeles counties.

Symptoms and Impact: Widespread tree mortality caused by borer beetles can have severe implications and impacts to the environment and human safety, including tree death and increased wildfire danger.

Prevention: Most of the prevention activities undertaken by the county revolve around public information and awareness. Many wood-boring pests are spread by the transport of infested wood material. According to the University of California Agriculture and Natural Resources, researchers believe that the goldspotted oak borer may have traveled to California from Arizona on infested firewood. Refraining from moving firewood, proper disposal of infested material and proper pruning are recommended to prevent the spread of these pests.

Sudden Oak Death: A disease of oak trees and more than one hundred other plant species, *Phytophthora ramorum* (or Sudden Oak Death), has been found throughout much of coastal California, and was identified in San Luis Obispo County for the first time in 2016 in Bay Laurel Trees. This disease has killed over a million trees in Coastal California forests and has the potential for broad ecological changes to natural areas, including significantly increasing the risk of wildfire.

Figure 5-27 Sudden Oak Death



This pathogen is also a serious concern to the commercial nursery industry.

Symptoms and Impact: On oaks and tanoak, cankers are formed on the stems. Cankered trees may survive for one to several years, but once crown dieback begins, leaves often turn from green to pale yellow to brown within a few weeks.

Figure 5-28 Bleeding Ooze from a Canker on an Oak



Black or reddish ooze often bleeds from the cankers, staining the bark, as well as killing the mosses that grow on it. Bleeding ooze may be difficult to see if it has dried or has been washed off by rain. Necrotic bark tissues surrounded by black zone lines are present under affected bark. Because these symptoms can also be caused by other *Phytophthora* species, laboratory tests must be done to confirm pathogen identity. Infected coast live oaks sometimes gradually lose their leaves and fade out slowly. If bleeding oaks and leaf spots on bay laurel or other symptomatic hosts are adjacent to one another, the presence of *Phytophthora ramorum* is likely.

Prevention: Preventative measures consist of pest detection, exclusion and eradication in production nursery settings, and informing the public and the nursery industry about the dangers of moving infected plant material out of infested areas.

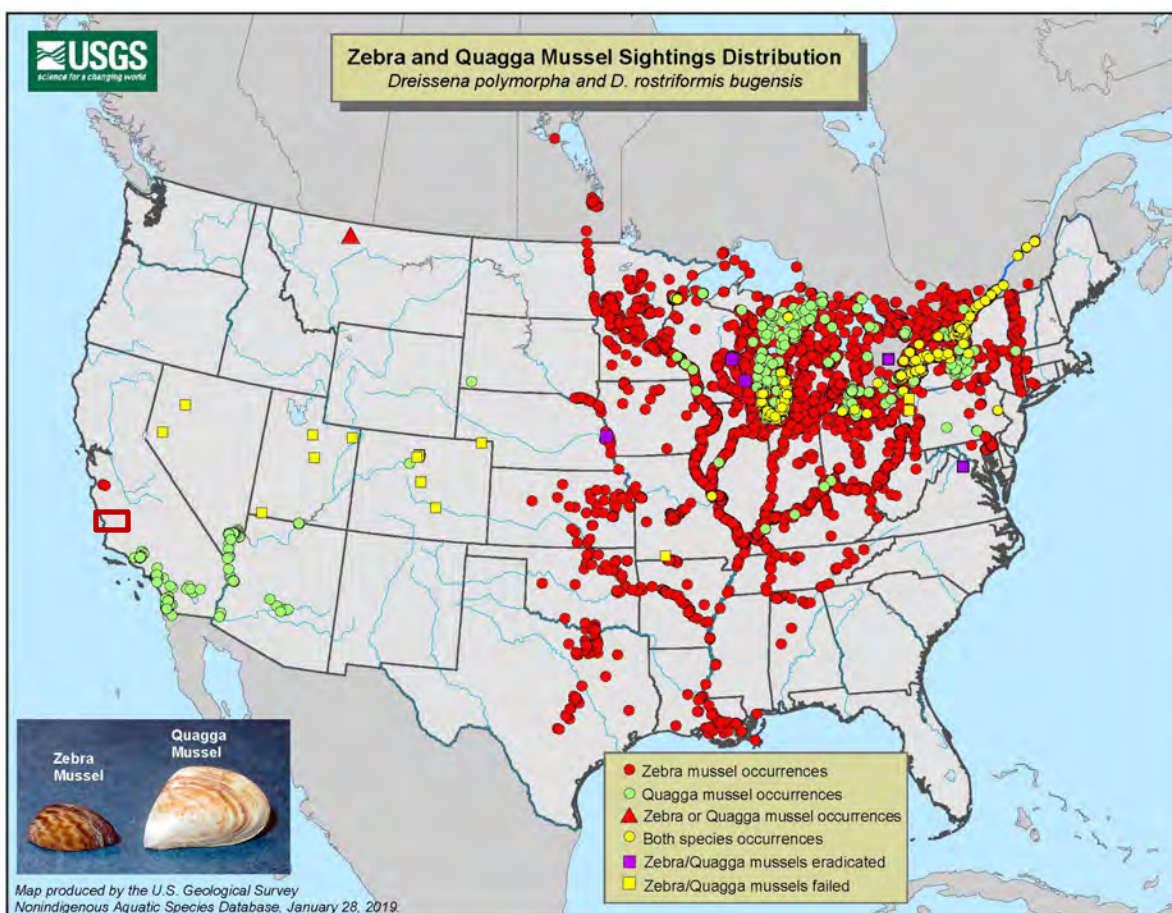
Quagga/Zebra Mussels: Quagga/Zebra mussels are non-native freshwater mussels from eastern Europe that clog waterways, undermine healthy lake ecosystems, ruin boat engine cooling systems, and financially burden water resources agencies. Prolific breeders, these mussels can overrun a lake causing hundreds of thousands of dollars' worth of damage annually. Rapid reproduction can negatively disrupt an ecosystem in a short amount of time. Once these mussels are introduced into a waterway, there is no way to fully eradicate the species.

Figure 5-29 Quagga/Zebra Mussels



According to the daily USGS Nonindigenous Aquatic Species Database, no reported Quagga/Zebra mussels have been found in waterways in the county as of January 28, 2019, though occurrences have been reported both north and south of the county.

Figure 5-30 Zebra and Quagga Mussels Sightings Distribution Map



Source: USGS; San Luis Obispo County general area noted by red square

Prevention: California has passed the Dreissenid Mussel Prevention Program, which requires vulnerability assessments on uninfested reservoirs and development of programs to prevent the introduction of the mussels, including public information, monitoring and management of recreational activities. San Luis Obispo County currently engages in a public information campaign to spread information regarding this invasive species.

Probability of Future Occurrences

While probability of future occurrence is usually calculated based on past experience, different pests have different recidivism rates across the county. Based on past experience, pests and invasive species will continue to present a constant threat to the county and its jurisdictions.

Climate Change Considerations

California's Fourth Climate Change Assessment (2018) notes that "climate change impacts terrestrial ecosystems and wildlife in multiple ways, including invasion by exotic species, prevalence of wildlife disease, and loss of native habitats." Changing climate conditions can impact viable living areas of species and cause migration; changing habitat temperatures can make previously undesirable habitats welcoming for new species and lengthen habitable seasons.

Vulnerability

General Property

Grapes (glassy winged sharpshooter, vine mealybug), trees (pine pitch canker, light brown apple moth, sudden oak death) and reservoirs and waterways (zebra mussels) are all at risk from invasive species and pests. An infestation of agriculture pests could impact crop yields, potentially destroying whole fields. Zebra mussels can cause damage to water-based property, including boat engines.

Between 2015 and 2018, the RMA paid no indemnities due to damage from insects, and \$22,900 in indemnities due to damage from crop disease.

People

A widespread infestation of animals/livestock and crops could impact the economic base of the county and its communities. According to the USDA 2012 Census of Agriculture, San Luis Obispo 2,666 farms, - 4% change from the previous census in 2007. Jobs could be negatively impacted during an agriculture emergency; jobs tangentially tied to the agriculture industry could also be affected.

Disease can exacerbate the impacts from other hazards, and an example of this is adverse weather; dead branches can be broken by high winds, and there are reports of these branches falling and causing harm to people.

Social Vulnerability

Based on the SoVI data presented and discussed in subsection 4.4.1, the communities located in north county San Luis Obispo where much of the grape production activities take place in the county are also ranked as having the highest overall social vulnerability, including San Miguel and Paso Robles. These communities as well as those working in the agricultural sector in south county, would likely be impacted by the effects of agricultural hazards compared to coastal areas of the county.

Critical Facilities and Infrastructure

The major pest/invasive species identified in this section with the potential to impact critical infrastructure is the quagga/zebra mussel. In large concentrations, zebra mussels can accumulate in waterways, clogging pipes and damaging equipment used for drinking water and irrigation. As discussed previously, dead trees can exacerbate the impacts of other hazards; more information on this hazard can be found in the Vulnerability section of the Adverse Weather section. Additionally, dead trees can accelerate the spread of wildfire, adding to the vulnerability of infrastructure; analysis of wildfire risk in relation to parcels is located in the Adverse Weather section as well.

Economy

According to the University of California's Center for Invasive Species Research, it has been estimated in California alone that invasive pests cost the state at least \$3 billion per year. Nationally, it is estimated that invasive species cost the USA \$138 billion per year. Economic impacts include both prevention, response and recovery costs.

Historic, Cultural, and Natural Resources

Invasive species typically harm native species through predation, habitat degradation and competition for shared resources; they can muscle native species out of natural habitats and are a leading cause of population decline and extinction in animals.

Tree mortality raises the wildfire threat in healthy forests, increasing the vulnerability, strength, speed and destruction of fires in the area.

Future Development

Most likely, good development practices in the future would not have an impact on the planning area's vulnerability to agricultural pests, plant diseases, marine invasive species or tree mortality.

Risk Summary

- The overall significance is Medium
- San Luis Obispo is vulnerable to a variety of plant diseases, infestations and invasive species; not all pests identified in this section
- Rapid detection, response, efforts are essential to stop the spread of agricultural pests, plant diseases and marine invasive species
- Infestations, pests and invasive species could cost millions in response and recovery
- There are public programs in place regarding prevention, response and eradication to pests and infestations
- Risk Management Agency (RMA) crop indemnities for insect and disease damages have been relatively low compared to total crop value
- Infestations, pests and diseases can worsen impacts from other hazards including wind and drought, and can cascade into other hazards including infrastructure failure and wildfire
- *Related hazards:* Adverse Weather, Drought, Wildfire

Figure 5-31 Risk Summary by Jurisdiction

Jurisdiction	Geographic Area	Probability of Future Occurrence	Magnitude/Severity (Extent)	Overall Significance
San Luis Obispo County	Limited	Highly Likely	Negligible	Medium
City of Arroyo Grande	Limited	Highly Likely	Negligible	Medium
City of Atascadero	Limited	Highly Likely	Negligible	Medium
City of Grover Beach	Limited	Highly Likely	Negligible	Medium
City of Morro Bay	Limited	Unlikely	Negligible	Low
City of Paso Robles	Limited	Limited	Unlikely	Low
City of Pismo Beach	Limited	Unlikely	Negligible	Low
City of San Luis Obispo	Limited	Highly Likely	Negligible	Medium
Avila Beach CSD	Limited	Unlikely	Negligible	Low
Ground Squirrel Hollow CSD	Limited	Unlikely	Negligible	Low
Heritage Ranch CSD	Limited	Unlikely	Negligible	Low

Jurisdiction	Geographic Area	Probability of Future Occurrence	Magnitude/Severity (Extent)	Overall Significance
Los Osos CSD	N/A			
Nipomo CSD	Limited	Unlikely	Negligible	Low
San Miguel CSD	Significant	Occasional	Limited	Medium
San Simeon CSD	Significant	Likely	Limited	Low
Templeton CSD	N/A			
Cayucos Sanitary District	Limited	Unlikely	Negligible	Low
Port San Luis Harbor District	Extensive	Unlikely	Negligible	Low
San Luis Obispo FCWCD	Limited	Highly Likely	Negligible	Low
South San Luis Obispo Sanitary District	Limited	Highly Likely	Negligible	Medium



5.3.6 Biological Agents (Naturally Occurring)

Hazard/Problem Definition

Public health associated hazards may be naturally occurring or the result of malevolent acts such as terrorism. The Hazard Mitigation Planning Committee determined in 2013 that this plan should focus on naturally occurring hazards such as pandemic flu and flood and waterborne illnesses; the 2019 update follows this precedent. Terrorism and other homeland security concerns are addressed separately by the county's Office of Emergency Services.

The following diseases caused by naturally occurring biological agents possess epidemic potential for San Luis Obispo County.

Influenza (Pandemic)

Influenza viruses have for centuries threatened the health of humans and animals worldwide by causing a contagious respiratory illness with mild to severe severity. Annual influenza epidemics create a significant public health burden with the highest risk of complications occurring in the elderly, children under the age of 2, and individuals with prior medical conditions. This virus' diversity and propensity for mutation has prevented the development of both a universal vaccine and highly effective antiviral drugs. Ongoing concern exists over the potential emergence of a new strain of influenza with the ability to infect and be passed between humans. Because humans won't have immunity to this novel virus, a worldwide epidemic (pandemic) could result as recently occurred.

Three human influenza pandemics have occurred in the 20th century each resulting in illness in approximately 30 percent of the world population and death in up to 2 percent of those infected. The 1918 Spanish Influenza (H1N1) pandemic occurred towards the end of World War I. More people died during the flu pandemic than were killed during the entire war. The influenza death toll was an estimated 50–100 million worldwide. In the United States, about 675,000 died. The 1957 Asian Influenza (H2N2) pandemic killed 1–2 million worldwide and caused approximately 70,000 deaths in the United States. The third pandemic, the Hong Kong Influenza (H3N2), occurred in 1968–69 and killed an estimated one million people worldwide.

More recently, a novel influenza virus emerged, the 2009 H1N1, which spread worldwide and caused the first flu pandemic in over 4 decades. In the U.S., the Centers for Disease Control and Prevention (CDC) believed H1N1 may have been responsible for up to 17,000 deaths as of May 2010. According to the California Department of Public Health, 2018 was an especially strong flu season in the Golden State.

San Luis Obispo County is proactive in prevention and education efforts every flu season, ensuring residents are informed of the dangers of the flu and encouraging flu shots and other prophylactic measures.

Prevention: Preventing transmission of influenza virus and other infectious agents within healthcare settings requires a multi-faceted approach. Spread of influenza virus can occur among patients, healthcare personnel, and visitors. Additionally, healthcare personnel may acquire influenza from persons in their household or community.

Prevention strategies include:

- Administration of influenza vaccine

- Implementation of respiratory hygiene and cough etiquette
- Appropriate management of ill healthcare personnel
- Adherence to infection control precautions for all patient-care activities and aerosol-generating procedures
- Implementing environmental and engineering infection control measures.

General public prevention measures include:

- Educating the public on cough etiquette and basic personal hygiene
- Immunization with available influenza vaccine

Once an epidemic has been identified, the County of San Luis Obispo County Public Health Department will respond in the following manner:

1. Investigate the epidemic to determine its etiology, level of severity, mode of transmission, and persons affected and at risk.
2. Determine and institute control measures to prevent further spread.
3. Communicate control measures to the public and healthcare professionals.

The San Luis Obispo Community Health Assessment, published in July 2018 notes that nationally, an estimated 200,000+ people are hospitalized each year due to flu-related complications. The report notes that from 2014-2016, less than half (41%) of people in the county received their annual flu shot – lower than the state overall in the same period. Between 2000 and 2010, an average of 43 deaths per year occurred in the county with a primary cause of influenza or pneumonia. Influenza/pneumonia was the 9th leading cause of death in the county between 2005 and 2013.

Novel Infections (SARS et al)

Novel infections, particularly those of viral origin, pose a tremendous risk to public health because the general public has no immunity from prior infections or vaccination, and because a vaccine is not readily available. For influenza viruses, it takes at least six months to produce large quantities of vaccine. For other viral pathogens such as HIV, a vaccine that protects individuals against HIV infection has been the goal of many research programs for the past two decades, yet only in the past few years has a vaccine reached the clinical trial stage.

Vaccines, which are believed to work by activating the body's ability to produce antibodies, eliminated or curtailed smallpox, polio and other feared viral diseases.

One novel virus that took the world by surprise was the appearance of the Severe Acute Respiratory Syndrome (SARS) virus in China at the end of 2002. Within months, this coronavirus spread internationally, with the help of air travel, resulting in 8,098 cases in 26 countries with 774 deaths occurring.

Prevention: Preventative measures consist of preparedness planning to enable the rapid detection, investigation and detainment of unexplained clusters of illness or death. Isolation of persons with unexplained potentially infectious disease may be indicated.

Food and Waterborne Illness

Food and waterborne illnesses are major global health problems resulting in over 2 million deaths per year. In the United States alone, an estimate 76 million cases of foodborne disease occurs annually resulting in 325,000 hospitalizations and 5,000 deaths.

The following biological agents have been historical threats to the food and water supply in this county.

- Staphylococcus aureus
- Salmonella species
- E. coli 0157: H7
- Campylobacter species
- Amebiasis
- Hepatitis A
- Shigella species

Food-borne outbreaks are identified by the presence of illness shortly following a meal. Illness can occur within a few hours and up to several weeks. Symptoms range from mild to severe:

- Upset stomach
- Abdominal cramps
- Vomiting
- Diarrhea
- Fever
- Dehydration

Intrinsic problems in food or water production, processing, storage, distribution, or preparation can all result in contamination of the food supply. Because food production and distribution practices are constantly changing, new unforeseen problems will continue to emerge. The need for ongoing monitoring and control efforts is essential.

Prevention: Preventative measures are based on the principles of: avoiding food contamination, destroying contaminants, and preventing further spread. Specifically, these include:

- Education of food handlers about sanitation, food and personal hygiene, kitchen cleanliness, temperature control, thorough cooking of animal related food products and hand washing before, during and after food preparation.
- Reducing food-handling time from initial preparation to service to be no more than 4 hours at ambient temperature.
- Teaching food handlers, the importance of keeping wounds covered and not working with nasal or eye infections, boils, abscesses or other purulent skin lesions.
- Exclude individuals with diarrhea from food handling and from care of hospitalized patients, the elderly and children.
- Education of farmers on the importance of sanitary work practices and safe food preparation and transportation.

Antibiotic Resistant Microorganisms (e.g. MRSA, MDR and XDR-TB)

MRSA: Methicillin-resistant *Staphylococcus Aureus* (MRSA) is a bacterium that is resistant to certain antibiotics called beta-lactams. These antibiotics include methicillin and other more common antibiotics such as oxacillin, penicillin, and amoxicillin. In the community, most MRSA infections are skin infections. More severe or potentially life-threatening MRSA infections occur most frequently among patients in healthcare settings. While 25% to 30% of people are colonized in the nose with *staphylococcus*, less than 2% are colonized with MRSA.

MRSA Community Transmission: MRSA infections, as with all *Staphylococcus*, are usually spread by having contact with someone's skin infection or personal items they have used, like towels, bandages, or razors that touched their infected skin. These infections are most likely to be spread in places where people are in close contact with others—for instance, schools and locker rooms where athletes might share razors or towels.

Factors that have been associated with the spread of MRSA skin infections include: close skin-to-skin contact, openings in the skin such as cuts or abrasions, contaminated items and surfaces, crowded living conditions, and poor hygiene. People may be more at risk in locations where these factors are common, including: athletic facilities, dormitories, military barracks, households, correctional facilities, and daycare centers.

Prevention: Preventative measures consist of good hygiene practices, using Standard Precautions in healthcare settings and patient education.

MDR and XDR Tuberculosis: Tuberculosis (TB) is a disease caused by the infectious bacterium *Mycobacterium tuberculosis*. It is responsible for 1.7 million deaths globally each year (230,000 are HIV associated cases). Person to person transmission of TB occurs when droplet nuclei are inhaled (typically occurs after sustained or recurrent exposure to an infected patient from coughing, sneezing, talking, singing or spitting). The aerosolized particles (bacilli) are inhaled into the lungs and subsequently ingested by alveolar macrophages initiating a new infection. The treatment regimen for infected patients involves multiple drug therapy for a minimum of 6 months. If not properly treated, TB can be fatal.

Outbreaks of multidrug-resistant TB (MDR-TB) defined as exhibiting resistance to at least isoniazid and rifampicin, have occurred primarily in settings where HIV-infected persons congregate such as hospitals, prisons, drug treatment clinics and HIV residences. These outbreaks have been associated with high fatality rates. Transmission of *M. tuberculosis* to healthcare workers and other patients also occurred.

Recently, extensively resistant TB (XDR-TB) has emerged. This is defined as MDR-TB plus resistance to any fluoroquinolone and any of the three injectable drugs (amikacin, capreomycin and kanamycin). Outbreaks have primarily occurred in situations where the use of second-line TB drugs has been used and poorly managed. A 2005-2006 outbreak in South Africa resulted in a 98% fatality rate and a median survival rate of 16 days from the date of XDR-TB diagnosis.

Prevention: Preventative measures include: 1) Promptly identifying and treating infectious patients, 2) Active case finding for secondary cases of TB amongst contacts with subsequent treatment, 2) Public education, 3) Reducing overcrowding, and 4) Providing outreach services for direct supervision of patient therapy.

Vector-Borne Diseases

One area of particular concern for the County of San Luis Obispo is the limited surveillance for vector borne diseases such as West Nile Virus. Surveillance efforts throughout California have been extensive, including human and horse case detection, and WNV testing of mosquitoes, sentinel chicken flocks, and dead birds. Because San Luis Obispo County is one of the few remaining counties in California without a Vector Control District, the risk of vector borne diseases increases.

Environmental Hazard

Valley Fever (coccidioidomycosis): Valley Fever is an illness caused by breathing in a fungus which lives naturally in the soil in San Luis Obispo County. When the soil is disturbed – by wind, construction, or everyday activities such as biking or gardening – people can breathe in the spores from this fungus and develop Valley Fever.

Most people who become infected with Valley Fever (60%) do not experience any symptoms and do not need treatment. Around 30%-40% of people develop flu-like symptoms such as severe fatigue, cough, fever, heavy sweating at night, loss of appetite, muscle and joint aches, and sometimes a rash. A small percentage experience a much more serious form of the disease in which the infection spreads throughout the body. People who experience this serious form of Valley Fever are at risk of dying from complications of the disease and may need to take medication for the rest of their lives. Valley Fever is more common among older adults, though anyone of any age can contract it. Several groups of people are at higher risk for developing the severe forms of Valley Fever, including African Americans, Filipinos, women in the third trimester of pregnancy, and people with weak immune systems.

According to the County of San Luis Obispo Public Health Department, Valley Fever appears to be on the rise in recent years, with 2017 bringing the highest number of recorded cases on record to California. A March 2013 Morbidity and Mortality Weekly Report published by the Centers for Disease Control and Prevention (CDC) and referenced in the 2018 California State Hazard Mitigation Plan notes that more than 20,000 cases of Valley Fever are reported each year in the United States, but many more cases likely go undiagnosed. Some researchers estimate that each year the fungus infects more than 150,000 people, many of whom are sick without knowing the cause or have symptoms so mild they are not recognized.

Prevention: Persons can limit their risk of Valley Fever by taking steps to avoid breathing dirt and dust in the air, avoiding dusty areas, dampening soil to prevent it from drifting in the air, staying inside and sealing windows during dust storms, and closing car windows and setting air conditioners to recirculate while driving on dust-filled roads.

Mosquito-Borne Illness: Mosquito-borne viruses belong to a group of viruses commonly referred to as arboviruses. Although 12 mosquito-borne viruses are known to occur in California, only West Nile Virus, Western Equine Encephalomyelitis (WEE) virus and St. Louis encephalitis (SLE) virus are significant causes of human disease. West Nile continues to seriously affect the health of humans, horses, and wild birds throughout the state. As of 2019, San Luis Obispo County does not provide mosquito abatement services.

Zika virus has been found in California, but according to the California Department of Public Health, Zika infections in the state have mainly been reported in people who were infected while traveling in areas outside of California with ongoing Zika transmission. As of 2019, there are no records of local transmission of Zika anywhere in California.

Prevention: The CDC recommends insect repellent, covering exposed skin and making sure mosquitoes stay outdoors as methods of preventing insect bites and disease transmission.

Lyme Disease: Lyme disease is transmitted by the western black-legged tick. Lyme disease was first described in North America in the 1970s. Though the tick has been reported in 56 of the 58 counties in California, the highest incidence of the disease occurs in the northwest coastal counties and northern Sierra Nevada counties with western-facing slopes. According to the California Department of Public Health, San Luis Obispo County is in an area where the western black-legged tick is commonly found; however, Lyme disease cases are not common or go unreported.

Prevention: Risk factors for Lyme disease include spending time in wooded or grassy areas, having exposed skin and not removing ticks promptly and properly. Prevention techniques include covering up, using insect repellents, checking clothing, yourself, children and pets for ticks, and removing a tick as soon as possible with tweezers.

Geographic Area

Disease outbreaks usually occur in densely populated areas, where person to person proximity provides ample opportunity for transmission of illnesses. Places of work and business, schools and high-population public spaces are of particular concern when the threat of transmissible illness occurs.

Vector-borne illness are concentrated around the vector they are transmitted by: the risk of Lyme disease is highest in wooded areas, and mosquito-borne illnesses are most prevalent around standing water. Due to its prevalence in the soil across the county, Valley Fever is of concern throughout the planning area.

Extent (Magnitude/Severity)

The diseases with the potential to have the most impact is novel influenza and pandemic flu, which has the potential for high morbidity (infected) and mortality (fatality) rates. This could include treatment and hospitalization of hundreds or more depending on the severity of the outbreak.

Previous Occurrences

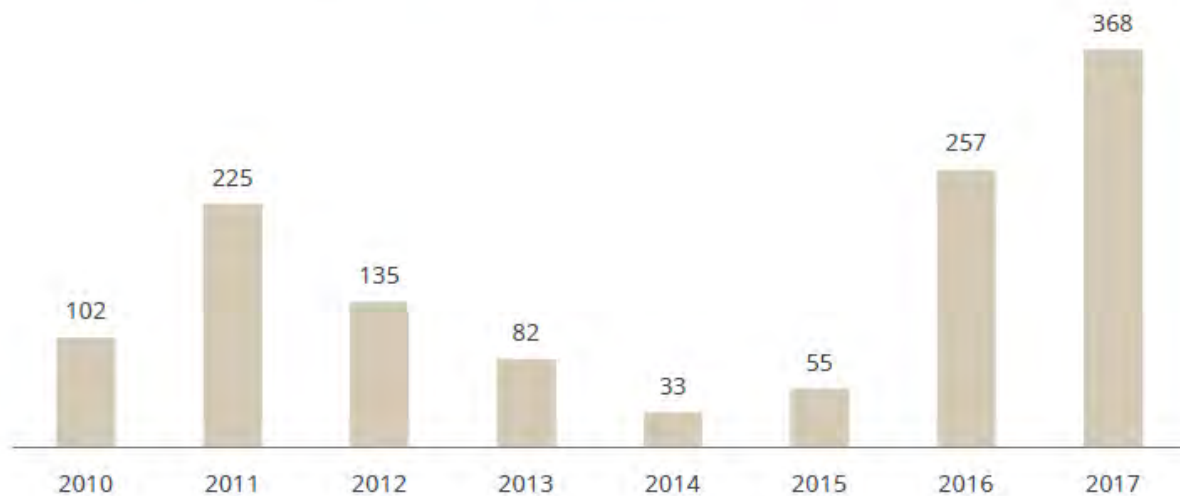
The Community Health Assessment published in July 2018 provides historical disease counts in San Luis Obispo County between 2010 and 2017.

West Nile Virus: The Community Health Assessment notes that statewide, cases of West Nile virus rose from 442 in 2016 to 516 in 2017; while the last reported case of the virus in the county occurred in 2016, West Nile continues to be present in the county, as testing of dead birds has confirmed.

Lyme Disease: There were 11 reported cases of confirmed Lyme disease among San Luis Obispo residents from 2006-2015, or an incidence rate of 0.4 per 100,000 population.

Valley Fever: The following figure notes Valley Fever cases in San Luis Obispo County from 2010–2017.

Valley Fever Cases, San Luis Obispo County, 2010-2017



Source: County of San Luis Obispo Public Health Department

According to the CDC, while the reasons for the increased incidence in Valley Fever in 2016 are not known, climatic and environmental factors favorable to Valley Fever proliferation and airborne release might have contributed, including rainfall after several years of drought and soil disturbance resulting from construction. The UC Davis Valley Fever Center attributes the increase in cases to drought conditions and firefighting equipment stirring up fungus in the soil.

Foodborne Illnesses: In San Luis Obispo County in 2017, reported cases of foodborne illness included 72 cases of campylobacter, 16 cases of E. coli, no cases of listeria, 29 cases of salmonella, and 8 cases of shigella. While it is possibly the most common cause of gastrointestinal disease, data is not available for norovirus as health care providers are not required to report it to the Public Health Department.

Antibiotic Resistant Microorganisms: The CDC reported in 2016 that for the first time, researchers have identified a person in the United States carrying a bacteria resistant to antibiotics of last resort, an alarming development that could mean the “end of the road” for antibiotics.

Probability of Future Occurrences

The potential exists within the entire county and in all regions of the U.S. for an outbreak of an infectious disease to occur that would dramatically affect the health and safety of the general public and the economy of the affected area, state and possibly nation. The County of San Luis Obispo Public Health Department has been proactive in its infection control surveillance efforts and in its emergency preparedness planning activities.

The San Luis Obispo County Community Health Assessment notes annual recurrence in cases of Valley Fever and Lyme Disease between 2010 and 2017, or a 100% annual recurrence rate. For Lyme Disease, the Assessment notes cases in 2011-2017 (none reported in 2010), or an 87.5% chance of recurrence per year. Foodborne illnesses are an annual occurrence in the county.

No known cases of Zika Virus transmission have been recorded in the county or the State of California, though once case of travel related Zika was reported in the county in 2016; this constitutes a 0% recurrence interval.

The Community Health Assessment notes that nationally, it is estimated that 5% to 20% of the population is infected with influenza, though rates of infection vary among age groups. The Assessment also notes that between 2000 and 2010, an average of 43 deaths per year occurred in San Luis Obispo County with a primary cause of influenza or pneumonia.

The greatest ongoing concern national health agencies have is the potential emergence of a novel influenza virus as recently occurred with the 2009 H1N1 pandemic. For the past several years, federal, state and local governments have been actively engaged in pandemic influenza preparedness planning efforts. The County of San Luis Obispo Public Health Department has an up-to-date Pandemic Influenza Plan and Medical Countermeasure Plan. While influenza is an unpredictable virus, these preparedness measures will facilitate prevention, early detection and treatment when the next pandemic does strike. Globally, an average of three pandemic influenza outbreaks have occurred per century over the past 300 years.

Climate Change Considerations

Climate change will likely affect vector-borne disease transmission patterns. Changes in temperature and precipitation can influence seasonality, distribution, and prevalence of vector-borne diseases. A changing climate may also create conditions favorable for the establishment of invasive mosquito vectors in San Luis Obispo County, and dry conditions have the potential to exacerbate prevalence of Valley Fever.

Vulnerability

General Property

Historically, naturally occurring biological agents and vector-borne illnesses do not have a direct impact on general property.

People

The health of the general public is the main impact from naturally occurring biological agents. Each disease has its own morbidity and mortality rates, as well as various rates and vectors for transmissibility. Specific impacts of diseases profiled in this section are included in the Hazard/Problem Definition section.

As a worst case scenario, the most notable pandemic influenza outbreak was the 1918 Spanish Flu that was responsible for 20 million to 40 million deaths throughout the world. In 2009, a pandemic of H1N1 influenza, popularly referred to as the swine flu, resulted in many hospitalizations and deaths.

Social Vulnerability

The areas of the county that have the highest overall social vulnerability, based on the SoVI data discussed and presented in subsection 4.4.1, will also be the most vulnerable to the effects of naturally occurring biological agents and pandemics. Outreach and public education efforts related to these hazards should be focused on the communities that are among the highest social vulnerability in the county.

Critical Facilities and Infrastructure

While biological agents and vector-borne illnesses would not have direct structural impacts on critical facilities and infrastructure, the potential exists for impacts to critical facility and infrastructure operation. A widespread disease and any associated social distancing could cause absenteeism at the workplace. Disease and illness could also cause pressure on the county's public health system, with an outsized number of patients seeking treatment and the potential for a diminished number of health care workers to meet the demand.

Economy

Disease mainly has an impact on economic drivers, including commerce. The risk of disease exposure may cause consumers to avoid brick and mortar establishments, though e-commerce may not be as affected. Social distancing put in place to limit exposure to and spread of disease may also impact workplace efficiency, as people stay home and away from public places. Additionally, tourism may be impacted in affected areas.

Historic, Cultural, and Natural Resources

By and large, impacts from naturally occurring biological agents are focused on people; biological agents would not have an adverse impact to historic, cultural or natural resources.

Future Development

No impacts to future development are expected from this hazard.

Risk Summary

- San Luis Obispo County and its population is vulnerable to a variety of different naturally occurring diseases
- Ongoing Public Health surveillance and emergency preparedness planning activities are geared towards minimizing the likelihood and reducing the severity of such an occurrence
- While the greatest impacts in the county from disease occur to populations, secondary impacts include reduced workplace efficiency and effects on the tourist trade
- Past and recent history dictates that the most likely microorganism to be involved in a local epidemic or global pandemic is the influenza virus; antibiotic-resistant microbes are also a grave concern
- Due to an increasingly global marketplace for food products, occurrence of significant foodborne outbreaks is also on the rise
- The continued absence of a Vector Control District within San Luis Obispo County delays the detection of vector borne disease such as plague, tularemia and West Nile Virus
- Vector-borne illnesses can especially be impacted by environmental factors, including drought
- Due to the multiple biological agents referenced in this section, defining a single significance and probability rating for this hazard is difficult; scores in the Hazard Risk Summary table below are based on an outbreak of novel pandemic influenza, likely the worse-case scenario in the county. An overall significance of Medium is assigned to account for the lower probability of this event.

Table 5-31 Biological Agents Hazard Risk Summary

Jurisdiction	Geographic Area	Probability of Future Occurrence	Magnitude/Severity	Overall Significance
San Luis Obispo County	Extensive	Occasional	Critical	Medium
City of Arroyo Grande	Extensive	Occasional	Critical	Medium
City of Atascadero	Extensive	Occasional	Critical	Medium
City of Grover Beach	Extensive	Occasional	Critical	Medium
City of Morro Bay	Limited	Unlikely	Negligible	Low
City of Paso Robles	Limited	Limited	Unlikely	Low
City of Pismo Beach	Limited	Likely	Limited	Medium
City of San Luis Obispo	Extensive	Occasional	Critical	Medium
Avila Beach CSD	Limited	Unlikely	Negligible	Low
Ground Squirrel Hollow CSD	Limited	Unlikely	Negligible	Low
Heritage Ranch CSD	Limited	Unlikely	Negligible	Low
Los Osos CSD	N/A			
Nipomo CSD	Limited	Occasional	Negligible	Low
San Miguel CSD	Significant	Occasional	Critical	Medium
San Simeon CSD	Significant	Unlikely	Negligible	Low
Templeton CSD	Limited	Unlikely	Negligible	Low
Cayucos Sanitary District	Limited	Unlikely	Negligible	Low
Port San Luis Harbor District	Extensive	Unlikely	Catastrophic	Low
San Luis Obispo FCWCD	Extensive	Occasional	Critical	Low
South San Luis Obispo Sanitary District	Limited	Unlikely	Negligible	Low



5.3.7 Coastal Storm/Coastal Erosion/Sea Level Rise

Hazard/Problem Definition

Coastal Storm: Coastal storms are characterized by offshore storm systems that make landfall, bringing high winds, rain, and storm surges to the coastline (USGS 2018). They originate from the combination of low-pressure systems offshore that circulate counterclockwise with high-pressure systems that blow in one direction over a long period of time, which creates a phenomenon of rising water, resulting in massive waves beyond the normal movement of tides. Coastal storms may have hurricane-force winds and cause damage similar to that of a hurricane; however, they are not classified as such because they do not originate in the tropics. The destructiveness of a coastal storm depends on the duration, wind speeds, and tidal factors, with particularly severe potential for damage where strong storm-generated waves coincide with high tides or King Tides (exceptionally high tides that occur once or twice a year). Such storms can exacerbate beach and cliff erosion and increase risks of bluff failure or flooding in low-lying areas. They have the greatest impact on the coastline and coastal communities in the form of beach and cliff erosion which can expose bluff top structures or facilities to bluff failure or landslides, and flooding of low-lying communities due to storm surges and wave energy. During such events, property and infrastructure in unprotected low-lying areas can be damaged by wave attack or flooding, and evacuation routes can become inaccessible. When coastal storms coincide with high tides, as well as during El Niño years, coastal erosion and flooding hazards substantially increase (Russell & Griggs 2012).

Figure 5-32 Coastal Storm Damage at Pismo Beach, 1982/83 El Niño



Coastal storms can severely damage coastal development and substantially erode the shoreline, especially when they coincide with El Niño years; the 1982/83 El Niño-related storms destroyed coastal structures at Pismo Beach, damaging the Pier, RV park, access trail, and seawall; incurring an estimated replacement cost of over \$5.5 million in Pismo Beach alone (in 2019 dollars) (Dean et al. 1984).

Photo credit: Lance Nix

Coastal Erosion: Coastal erosion refers to the natural geological process resulting in loss of sand, sediment, vegetation, or soil on beaches, dunes, bluffs, or cliffs along the coast caused by the wave attack, winds, tides, coastal storms, and the gradual movement of tectonic plates. Coastal erosion takes place gradually over decades to thousands of years, or may occur rapidly, as with landslides or severe storms.

Coastal erosion processes are highly complex and depend on a number of factors such as geologic formation, groundwater seepage, and exposure to wave energy. The 100 miles of San Luis Obispo County coastline are variable in terms of geologic composition and exposure to high tides, wave energy and

related erosion. Sections of the coast exhibit a variety of backshore landforms including wide sand and cobble beaches backed by cliffs, sandy beaches backed by sand dunes, secluded and undeveloped pocket beaches, rocky intertidal areas, rocky bluffs, and loosely consolidated bluffs. Due to these various backshore types along the shoreline, erosion characteristics also vary significantly.

Driven by rising sea levels, large storms, flooding, and powerful ocean waves, erosion wears away the beaches and bluffs along shorelines. Beach and dune erosion occur through high wave run-up during high tides and increased wave energy that carry sand away from the shoreline. Beach and dune erosion may occur gradually over time as beaches naturally accrete and erode, resulting in mild changes in the shoreline and volume of sand present on the beach (Hapke et. al 2006). Energetic coastal storms and particularly strong El Niño events potentially result in the abrupt loss of large quantities of sediment and increased landward retreat of the shoreline.

Coastal bluff erosion also occurs in the form of irreversible landward retreat of coastal bluffs and cliffs (Griggs 2003). Historical bluff erosion has been episodic in nature with rates that vary throughout San Luis Obispo County due to the composition of coastline bluff rock formations and vulnerability to wave interaction with the cliffs. Rising tides, currents, and waves directed at the base of the bluff cause the erosion of relatively non-resistant rock. As a bluff erodes, the top edge moves landward. This is a natural process that becomes a hazard as it threatens structures or other developed property, infrastructure, as well as recreational trails and public coastal access. The retreat of the bluffs threatens waterfront residences, businesses, and public facilities, eventually rendering them uninhabitable or unusable.

Human alteration of the shoreline can influence long and short-term erosion rates. One of the major causes of beach erosion is the construction of dams and other structures along creeks and rivers that trap sediment and prevent it from reaching the ocean. This deprives the shoreline of the material that would replenish beach sand supplies. Coastal structures such as groins, jetties, seawalls, and breakwaters can also alter littoral drift. Beach groins and breakwaters, for example, can trap littoral sand and build beaches over a limited area; but by doing so, they reduce the amount of sand that flows to down-current beaches. This can result in a rapid loss of beach sand in down-current beaches. Seawalls are often used to protect seacliffs from eroding wave action. These structures, however, can reflect wave energy to strip protective beach sand at an accelerated rate. This may ultimately result in increased seacliff erosion rates, particularly at sections of coastline adjacent to the seawall.

Sea Level Rise: Sea level rise is defined as the relative average rise in mean sea level. Global sea level rise refers to the long-term gradual increase of sea levels driven by the expansion of ocean waters as they warm, the addition of freshwater to the ocean from melting land-based ice sheets and glaciers, and extractions from groundwater. Regional and local factors such as tectonics and ocean and atmospheric circulation patterns result in relative sea level rise rates that can be higher or lower than the global average. Sea level rise also contributes to increased coastal flooding and more frequent and severe tidal inundation. This can exacerbate existing coastal hazards from severe storms, as well as accelerate coastal beach and bluff erosion. Unlike coastal flooding caused by coastal storms, tidal inundation when combined with sea level rise would occur with predictable high tides and with some regularity. Existing low-lying coastal areas are expected to be semi-permanently or permanently inundated resulting from unabated global climate change and resulting sea level rise. Sea level rise is anticipated to contribute to increased coastal hazards including coastal storms and coastal erosion (County of San Luis Obispo 2019a).

Geographic Area

The entire 100-mile coastline of San Luis Obispo County and existing urban development and natural resources are potentially exposed to a range of coastal hazards, including coastal storms and coastal erosion. Such hazards are projected to become more severe when combined with sea level rise (County of San Luis Obispo 2019a). The creeks and rivers that drain inland mountains in confluence with the Pacific Ocean result in an ecologically diverse range of low-lying habitats including bays, inlets, and coastal wetlands. Additionally, bluffs and dunes line much of the County's coast, including the cities of Grover Beach, Pismo Beach, and Morro Bay. The coastline also includes five large unincorporated communities served by Community Services Districts (CSD): Avila Beach, Los Osos, Cambria, Oceano, and San Simeon; and extensive rural areas (County of San Luis Obispo 2019b). These areas contain a number of popular recreational beaches such as Pismo Beach, Morro Bay, Cayucos and Moonstone, along with visitor-serving uses, developed and undeveloped coastal bluffs and trails, two harbors (Morro Bay and Port San Luis), and a large dune field ranging from the Pismo Dunes through the Guadalupe Dunes. Low-lying portions of Highway 1, an officially designated State Scenic Highway, which has been damaged by past bluff erosion, also extend along the coastline. Designated State Parks in the San Luis Obispo Coast District include Cayucos State Beach, Estero Bluffs State Park, Los Osos Oaks State Reserve, Montana de Oro State Park, Morro Bay State Park, Hearst San Simeon State Park, and W.R. Hearst Memorial State Beach (Department of Parks and Recreation 2019). A summary of hazard potential by jurisdiction or urban area within the county are provided in Table 5-32 below.

Table 5-32 Hazard Potential of Jurisdictions and Urban Areas within the San Luis Obispo County Coast

Jurisdiction or Urban Area	Primary Characteristics and Vulnerabilities
City of Grover Beach	<ul style="list-style-type: none"> Sandy beaches backed by low sand dunes covered with dense vegetation Commercial, residential (i.e. mobile homes) and recreational (golf course) development Active erosion of beaches and dunes, impacts to low-lying coastal recreational uses, commercial and residential structures
City of Morro Bay	<ul style="list-style-type: none"> Wide sandy beaches and large sand dunes backed by residential and commercial development on higher elevated terraces Includes low-lying development, lagoons, trails, and saltwater marsh Active erosion of beaches and dunes, low-lying areas susceptible to projected sea level rise Erosion and landward retreat of bluffs
City of Pismo Beach	<ul style="list-style-type: none"> Topography varies from sandy beaches and sand dunes to cliffs and bluffs ranging from 10 to 100 feet in height Commercial and residential development close to the shoreline Parks on top of bluffs include Dinosaur Caves Park with trails and a playground; Chumash Park; Monarch Butterfly Grove Erosion of beaches and dunes; erosion and landward retreat of bluffs threaten residential, commercial, and recreational development Development close to the shoreline vulnerable to coastal hazards and sea level rise

Jurisdiction or Urban Area	Primary Characteristics and Vulnerabilities
Avila Beach CSD	<ul style="list-style-type: none"> Southerly-facing wide sandy beach backed by development including Avila Beach Park, commercial and residential development, and overnight accommodation Avila Beach beaches and recreational Pier protected from northerly swells by the Point San Luis Breakwater Erosion of the sandy beach threatens low-lying commercial, residential, and recreational development
Los Osos CSD	<ul style="list-style-type: none"> Sand dunes and scenic bluffs of the Los Osos Oaks State Natural Reserve Active erosion of sand dunes and bluffs Low-lying development in downtown Los Osos threatened by projected sea level rise, and inundation from coastal storms and flooding
San Simeon CSD	<ul style="list-style-type: none"> Low cliffs and rolling coastal hills of the Hearst San Simeon State Park¹ Supports low-lying areas of Highway 1 with little to no coastal development Erosion of low cliffs, coastal bluff retreat
Cayucos	<ul style="list-style-type: none"> Varies from narrow sandy beaches backed by undeveloped bluffs and sea cliffs; to wider sandy beaches backed by relatively low-lying coastal development Erosion of bluffs and sea cliffs, active erosion of narrow sandy beaches Sea level rise and coastal hazards threaten low-lying commercial and residential development
Port San Luis Harbor District	<ul style="list-style-type: none"> Port San Luis Pier, Boat Yard, and RV Campground backed by 100-foot high cliffs which descend eastward to lower elevations Southerly-facing beach protected from northerly swells by the Port San Luis breakwater Erosion of 30 to 100-foot high cliffs, coastal bluff retreat Sea level rise and coastal storms threaten Port San Luis Pier, Boat Yard, and campgrounds
Cambria	<ul style="list-style-type: none"> Rocky shoreline with some areas of narrow beaches backed by low cliffs approximately 20-50 feet high Bluff top residential development and public open space such as the Fiscalini Ranch Preserve Bluff retreat, active erosion of sandy beaches Projected sea level rise and accelerated bluff erosion threaten bluff top residential development
Oceano	<ul style="list-style-type: none"> Wide sandy beaches backed by low active dunes, residential development and campgrounds Popular for beach and dunes for off road vehicle use Active erosion of sandy beaches and dunes

Coastal Storms, Coastal Erosion, and Sea Level Rise by Area

The reported rates of erosion presented in the following sections approximate future coastal erosion rates and vulnerability due to difficulties in obtaining accurate erosion data.

San Luis Obispo County: The San Luis Obispo County coastline has the potential to be significantly impacted by coastal storms. Bluff erosion resulting in landward retreat of the seacliffs and beach erosion

may result in landward retreat of the shoreline and impacts to coastal development and infrastructure. Low-lying areas often located by coastal streams or estuaries are vulnerable to inundation, wave run-up and flooding associated with projected sea level rise. California's Fourth Climate Change Assessment notes that periodic El Niño events exert a dominant control on coastal hazards across the region, driven by seasonally-elevated water levels as high as 30 cm (11.8 inches) above average, and, on average, 30 percent larger winter wave energy in California (Langridge et al. 2018). Past El Niños, including the extreme 1982-83 and 1997-98 events, caused significant erosion along the Central Coast due to the elevated winter waves and water levels, but impacts were more acute along the southern ends of littoral cells due to the more southerly wave approaches driving sand to the north (Langridge et al. 2018). Further, the large El Niño event of 2015-16, one of the three largest in the historical record, resulted in winter wave energy that was over 25 percent larger than a typical winter along the Central Coast and caused substantial acceleration of beach erosion (State of California 2018).

City of Grover Beach: Grover Beach is fronted by sandy beaches backed by low active dunes that are covered with dense vegetation, backed by a golf course, a mobile home park and Highway 1. The sandy beaches provide structures with moderate protection from storm waves. Timber beach access ramps were damaged, however, during the winter storms of 1983. The Grover Beach shoreline is classified as a "moderate risk" with respect to possible coastal damage incurred by storm waves.

City of Morro Bay: The Morro Bay coast is fronted by large sand dunes from Atascadero State Beach and continuing south through much of Montaña de Oro State Park that provide protection for developments located on terrace materials behind the sand dunes. Due to the construction of the Morro Bay Harbor Breakwater and the presence of Morro Rock, the littoral drift north of Morro Bay is interrupted and the coast has extended seaward. The beach has widened about 250 feet near San Jacinto Avenue and almost 500 feet in front of Morro Bay High School in the past 50 years. This sandbar protects development in this region. The bay is protected by the sandspit south of Morro Rock that provides a barrier to wave attack that would otherwise impact the developed areas along the Embarcadero. Portions of Morro Bay are low-lying and are classified as a "high risk" with respect to possible future coastal flooding associated with sea level rise.

City of Pismo Beach: Cliffs and bluffs ranging in height from ten to one hundred feet exist along approximately five miles of the northwest portion of the city shoreline, with the southern areas of the city around the Pismo Beach Pier being low-lying. Bluff erosion rates in Pismo Beach vary from an average of 2 inches per year where bedrock is present to up to 12 inches per year in areas with limited bedrock (City of Pismo Beach 2002). Past studies have found that more than 60 homes are within the bluff retreat hazard zone and may be subject to damage or destruction by 2100, without accounting for accelerated bluff retreat associated with sea level rise (City of Pismo Beach 2002). Portions of Pismo Beach are either low-lying or are located atop eroding coastal bluffs and are classified as a "moderate risk" with respect to possible future coastal flooding or accelerated bluff retreat associated with sea level rise.

Figure 5-33 Bluff Erosion and Overlying Development at Dinosaur Caves Park in Pismo Beach, January 2010



Residential structures situated adjacent to coastal bluff cliffs are vulnerable to the impacts of coastal storms and actively eroding bluffs. Irreversible bluff erosion exacerbated by future sea level rise has the potential to damage communities such as those in Pismo Beach (January 2010). Source: San Luis Obispo Tribune 2010.

Avila Beach: Avila Beach is a southerly-facing sandy beach backed by areas of low-lying coastal development in the north along San Luis Creek including commercial and residential uses, hotels and Avila Beach Park, as well as homes atop a 10-35 foot high low coastal bluff. Although most of Avila Beach is protected by 10 to 20-foot-high seawalls, low-lying areas to the north including Avila Park, and coastal access parking are potentially exposed to wave run-up and flooding. Avila Beach is partially sheltered from northerly swells by the Point San Luis Breakwater but is vulnerable to coastal storms originating from the southwest. The 1983 El Niño event severely damaged the recreational pier at Avila Beach. Low-lying areas of Avila Beach are classified as a “moderate risk” with respect to possible future coastal flooding associated with sea level rise.

Los Osos-Baywood Park: The community of Los Osos-Baywood Park is located a hillside and low-lying areas of the shoreline of Morro Bay. The sand dunes of Morro Bay State Park sandspit and Park currently protect the community of Los Osos from potential wave hazards, although dozens of homes along the shoreline of Morro Bay are constructed just above sea level. The low-lying shoreline areas of this community along Morro Bay may have low to moderate risk with respect to future coastal flooding from sea level rise over the long term. It is unknown if sea level rise could eventually erode or lead to breaches in the sand dunes along Morro sandspit or to what extent such a breach could affect coastal flooding in Los Osos-Baywood Park.

San Simeon: San Simeon is fronted by a narrow sandy beach backed by low coastal bluffs that support several bluff top homes and a hotel with minimal setbacks and the town’s wastewater treatment plant, which is protected by a low rock revetment. These bluff top uses are currently exposed to moderate risk and may be threatened in the near term if bluff retreat rates accelerate with sea level rise. Such threats would be considered medium or high with projected sea level rise and potential accelerated bluff retreat.

Cayucos: The shoreline in Cayucos generally supports narrow beaches backed by low cliffs approximately 20 feet-high as well as a low-lying downtown area by Cayucos Creek, much of which is protected by low rock revetments and a low seawall. Over 100 residences with minimal setbacks from the edge of the bluff are potentially exposed to coastal erosion hazards, although a number are protected by rock revetments or seawalls. In the winter month the sandy beach often erodes, and waves strike directly against the

bluffs. The Cayucos shoreline faces south such that its beaches are partially protected from northerly swells. Wave action in this area is still significant. The seacliffs are comprised of Franciscan melanges, characterized by blocks of rocks often surrounded by small zones of sheared or crushed rock that tend to erode easily. Some zones contain more erosion resistant rock blocks that have been exposed as the weaker blocks have eroded away. During the intense storm waves of 1983, these resistant blocks were breached at some spots. As a result, the bluff receded as much as 20 feet (San Luis Obispo County 1999).

Figure 5-34 Low-lying Residential Development Fronted by Sandy Beaches in Cayucos



Cayucos shoreline residential development is typically fronted by a wide sandy beach that protects development from coastal storms and sea level rise; however, the beach provides limited protection from potentially severe coastal storms and associated wave run-up and flooding.

Rates of erosion are highly variable along this coastline and range from 6 to 10 inches per year. Emergency rip-rap and numerous seawalls were constructed in response to the storm waves of 1983 (San Luis Obispo County 1999).

Downtown Cayucos is another area of concern. Built upon the unconsolidated sediment deposited from the Cayucos creek, this area is susceptible to shoreline erosion.

During rainy months when the ground becomes wet, the low permeability of the clays tends to perch or elevate the groundwater table. Consequently, the saturated soils cause increased erosion due to slope instability and slumping of the seacliff face. Therefore, much of Cayucos is either low-lying around the downtown or includes bluff top homes with minimal setbacks and is therefore classified as “moderate to high risk” with respect to both existing coastal hazards and possible future coastal flooding and accelerated bluff retreat associated with sea level rise.

Port San Luis: Port San Luis and the coastline surrounding San Luis Bay is well-protected from the dominant northwesterly swells by the 2,300-foot long Port San Luis breakwater, though little protection is offered from southerly swells. The Port San Luis area is backed by 100-foot high cliffs that descend eastward into approximately 30-foot high cliffs. A rock revetment protects Avila Beach Drive from Port San Luis toward Avila Beach from storm waves and bluff erosion.

Historic storms have shown that both Port San Luis and Avila Beach are susceptible to coastal damage resulting from storm waves, especially those generated from southerly swells. Winter storm waves during 1983 El Niño-related coastal storms, for example, damaged the concrete seawall that runs parallel to Front Street. This region is classified with a “moderate risk” with respect to possible coastal damage incurred by storm waves.

Cambria: Cambria is characterized by rocky intertidal shoreline and narrow beaches backed by low cliffs approximately 20 to 40 feet high. This section of coastline is subject to moderate to heavy wave action, mostly from northerly swells. The coast in the area is comprised of a rock unit called the Cambrian slab that is a local, colloquial name for the Cretaceous-age sandstones that form the resistant rock headlands in the area. Since this type, of sandstone is fairly resistant to erosion, seacliff retreat rates in Cambria are relatively low when considering the wave energy imposed on this area. However, while some coastal bluff top homes are protected by rock revetments, dozens of homes along the coastal bluff tops have minimal setbacks and are currently threatened by erosion by wave action and current sea cliff erosion rates of two- to three- inches per year.

Figure 5-35 Low Coastal Bluffs and Residential Development in Cambria



The San Luis Obispo coastline is diverse in geologic composition and subject to variable coastal hazard impacts. Urban development adjacent to coastal bluffs are highly vulnerable to irreversible bluff erosion, such as those in Cambria in close proximity to the shoreline (pictured above).

All developed coastal areas of Cambria are in high hazard zones (USACE 2016). Much of the shoreline of Cambria includes bluff top homes with minimal setbacks and scattered rock revetments is therefore classified as “moderate to high risk” which would increase with respect to possible future accelerated bluff retreat associated with sea level rise.

Shell Beach: The coastline from Fossil Point proceeding eastward to Shell Beach is characterized by offshore rocks and sea stacks backed by 30- to 100-foot eroding cliffs. Seacliff retreat rates range from 4 to 7 inches per year for the Shell Beach coastline; catastrophic rock fall is an important agent of erosion in this area. Although many homes located adjacent to the coastline of Shell Beach are protected by seawalls, bulkheads, sandbags, and rip rap, this stretch of coastline is characterized as “high risk” with respect to possible erosion.

Oceano: Oceano is generally fronted by wide sandy beaches backed by low active dunes. These dunes provide protection for structures located nearby; however, they are subject to erosion during storm surges at extreme high tides. Although these sand dunes protect dwellings from storm waves, the winter storms of 1983 damaged structures and destroyed timber ramps that provided vehicular beach access. Therefore, this region is characterized with a “moderate risk” and a “high risk” region adjacent to the Arroyo Grande Creek mouth with respect to coastal erosion.

South County: The coastline from Oceano southward to the San Luis Obispo/Santa Barbara County line is described as “sandy beaches backed by active dunes with sparse vegetative cover, high intermediate old dunes with vegetative cover, marshes, and lakes” (San Luis Obispo County 1999). Although the dune face is wave-cut and experiences frequent slides, this region is classified with a “moderate risk” with respect to coastal erosion.

Extent (Magnitude/Severity)

All low-lying coastal areas within San Luis Obispo County including beaches are exposed to coastal storm hazards that would be subject to inundation with projected sea level rise. Increased frequency, severity, and duration of high tide and storm events related to climate change may also result in more frequent and severe storm events along the coast.

Coastal Storm: Coastal storms can cause high winds and strong storm surges that would affect low-lying “vulnerable” coastal resources and infrastructure located in urban areas such as Morro Bay. For wind hazards, the extent of wind speeds can range from tropical depressions (less than 35 kts), tropical storms (35-65 kts) to hurricane force winds are 65kt or greater. Low-lying areas susceptible to wave run-up and coastal flooding due to coastal storms are often protected by seawalls or revetments. These protective structures may be breached during a severe coastal storm, however, such as those associated with El Niño years and/or a 100-year coastal storm event. Wave runup elevations are used in coastal flood studies to determine flood hazard areas for sites along the open coast that are subject to direct assault by deep-water waves. Runup elevations range with location and local beach slope. Wave runup elevations for the 1% annual chance coastal storm range from 11 to 24 feet above Mean Sea Level depending on location; the 0.2 % annual chance wave runup elevations range from 17 to 30 feet, but generally are around 22 feet above Mean Sea Level. Actual depth of inundation would vary, depending on the ground elevation at a particular site. Areas with ground elevations 3 feet or more below the 1% annual chance wave runup elevation are subject to velocity hazard, shown as the VE zone on FEMA flood hazard maps. More details on specific sites can be referenced in the County’s 2012 Flood Insurance Study (FEMA 2012).

Coastal development on coastal bluffs and cliffs that are not susceptible to direct wave run-up and flooding are vulnerable to coastal storms and the resultant bluff erosion. All coastal development in proximity to the shoreline is threatened by landward retreat of the shoreline due to beach and bluff erosion, which are exacerbated by coastal storm events.

Coastal Erosion: Coastal erosion threats include both dune erosion and bluff erosion, and can result from storms, sea level rise, strong wave action, and human activities. Unlike coastal storms, cliff erosion can result in permanent and significant alterations of coastal geology that can expose landward development and resources to additional coastal threats. Large sections of the county coastline, especially those with rocky headlands or sea cliffs, are not vulnerable to flooding, but are highly susceptible to erosion (Heberger et. al 2009). Areas vulnerable to impacts of coastal beach erosion within the county include low-lying areas fronted by sandy beaches and dunes, including sand dunes at Pismo State Beach, Oceano,

and Los Osos. Impacts of coastal bluff erosion affect development above or adjacent to coastal cliffs and bluffs, including bluff top residential development in Cambria, Shell Beach, Pismo Beach, and the cliffs at the Point San Luis Lighthouse. Erosion extent can range from gradual wearing away of coastal land at inches per year to more significant, catastrophic events that can result in bluff failures involving several hundred cubic yards of material.

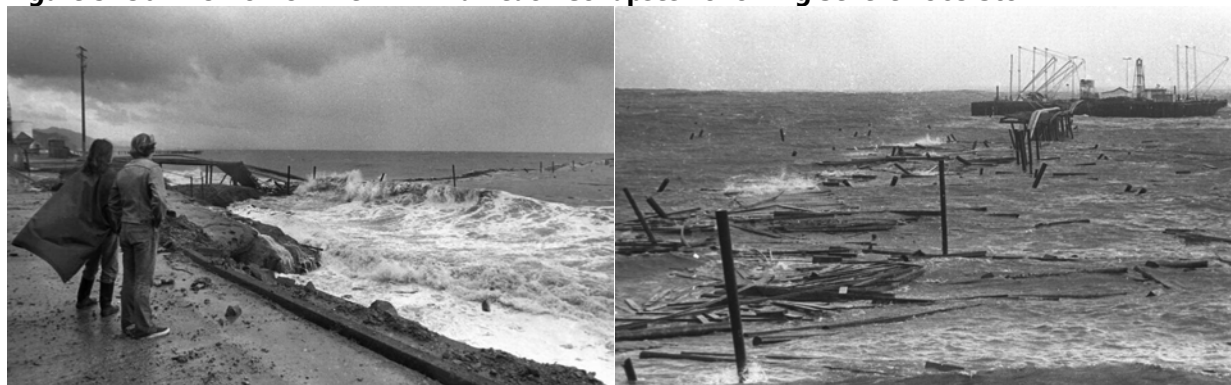
Sea Level Rise: Low-lying coastal areas such as those in Morro Bay, Oceano, Cayucos and portions of Avila Beach are more susceptible to wave run-up and flooding in combination with sea level rise than structures atop coastal cliffs; however, such bluff top structures may be threatened by accelerated bluff erosion induced by projected sea level rise. Projected sea level rise in Morro Bay may increase threats to low-lying habitats or development relative to current sea level conditions). Further, as noted above, sea level rise may lead to accelerated coastal bluffs retreat and erosion that may exacerbate threats to communities located along the cliffs and close to the coast such as Pismo Beach, Shell Beach, Avila Beach, Morro Bay and Cambria. Projected sea level rise may exacerbate saltwater intrusion into coastal aquifers potentially affecting water supply of some communities. Sea level rise may also exacerbate the frequency and depth of inundation of coastal marshland, leading to its conversion to open water or mudflat habitat. This in turn can increase the concentrations of brackish water that can compromise coastal marshland habitat integrity.

Specific to sea level rise, the extent of anticipated rise for the purposes of this plan is modeled for three different scenarios generally ranging from 1 ft, 3 ft, and 10 ft; this is described in more detail in the Vulnerability subsection; maps showing potential inundation from the three sea level rise scenarios are included in the jurisdictional annexes for Avila Beach, Cambria, Cayucos, Grover Beach, Los Oso, Morro Bay, Oceano, Pismo Beach, San Simeon and South San Luis Obispo County Sanitation District.

Previous Occurrences

Coastal Storm: Increased coastal erosion and flooding from intense storm activity along the California coast occurred during major El Niño events of 1982/83 and 1997/98 (Bromierski 2003). High tides and severe storm waves during the El Niño storm in March 1983 damaged the concrete seawall in Port San Luis as well as development within the community of Avila Beach (the wide sandy beach eroded and was not sufficient to protect urban development from severe storm waves). Housing developments in this area experienced landslide activity as well as cracking of foundations and roads. The Union Oil Pier at Avila Beach was also severely damaged, as well as the Avila Beach Pier (Figure 5- 36) (San Luis Obispo County 1999). Historic storms have resulted in substantial damage to coastal regions and demonstrated susceptibility of the coastline to swells originating in both the northwest and southwest.

Figure 5- 36 Union Oil Pier in Avila Beach Collapses Following Severe 1983 Storm



A severe coastal storm in March 1983 brought high winds and powerful surf that damaged coastal pier and infrastructure including sections of Highway 1 and destroyed the wooden Union Oil Pier in Avila Beach. Source: San Luis Obispo Tribune 2018.

El Niño-related storms cause increased damage to the coastline with heavy rainfall, energetic wave conditions, and accelerated dune and bluff erosion. Such storms are also correlated with increased coastal flooding magnitudes (Andrews et al. 2004). Wave height, sea level, and precipitation, which are the primary external forcing parameters in seaciff erosion, further increase with storm intensity. Significant cliff erosion and storm damage occurred along the central coast of California during the 1982/1983, 1997/1998 and 2015/16 El Niño winters (Table 5-33) (Storlazzi & Griggs 2000). Further data on previous storm occurrences and related impacts to the county are provided in subsection 5.3.1, *Adverse Weather*.

Table 5-33 Recorded El Niño related coastal storms and flooding in coastal communities within the County of San Luis Obispo

Storm Event (Year)	Primary Area(s) affected	Extent of Damage
El Niño, Winter 1982/83	Entire County Coastline	Heavy rainfall increased coastal flooding and accelerated dune and cliff erosion. Classified as one of the three strongest El Niño storms since 1950 ² .
March 1983	Avila Beach, Port San Luis	High intensity storm which brought 6-8 inches of rain; high energy surf over a 7-day period destroyed the Union Oil Pier in Avila Beach and seawall in Port San Luis ¹ .
El Niño, Winter 1997/98	Entire County Coastline	High intensity storm that impacted the coastline with high energy wave conditions, substantial rainfall, and accelerated beach and bluff erosion. Classified as one of the three strongest El Niño storms since 1950 ² .
El Niño, Winter 2015/2016	Entire County Coastline	High wind, rainfall, and energetic waves that accelerated beach and bluff erosion. Classified as one of the three strongest El Niño storms since 1950 ² .

¹ Source: (County of San Luis Obispo Public Works Department 2019)

² Source: (Jan Null 2019; World Meteorological Organization 2019)

Coastal Erosion: Coastal erosion within San Luis Obispo County has primarily occurred during periods of intense wave action coinciding with high tides and coastal storms. Local annual beach erosion rates from

1942 to 2002 (Hapke et. al 2006) range from three inches to over one foot (Table 5-34) (San Luis Obispo County 1999; USACE 2016). Beach erosion of up to 3 feet per year has occurred in areas including Cayucos, Morro Strand State Beach, Morro Bay State Park, Montaña de Oro State Park, Shell Beach, Pismo Beach, and Oceano Dunes. Historical rates may not accurately predict future erosion; however, as substantial erosion can occur during individual severe storms that are expected to be exacerbated by climate change and associated sea level rise. This can result in bluff and cliff collapse (Griggs 2003). Major historical erosion events coincide with heavy storm years including: Piedras Blancas in 2001, the general county coastline in 2010, and Shell Beach and Montaña de Oro in 2017 (Protsman 2018). Reliable estimates of retreat are difficult to obtain because the historical record and the quality of the information is limited relative to ongoing coastal processes (City of Pismo Beach 2002).

Dune erosion can either be short term where large coastal storm events and severe wave attack result in loss of sand or cliff failure, or long term with the gradual erosion of the shoreline over time due to onshore winds and high tides. Dune-backed shorelines may also change over time as dunes expand and recede (Hapke, 2006). Specific locations within the County experience differing rates of shoreline change. Long-term shoreline change in the northern section of the county has historically been approximately 0.1 meters (0.32 feet / 3.84 inches) of erosion per year, and short-term change averaged 0.7 meters (2.30 feet / 27.6 inches) of erosion per year. Short-term shoreline changes averaged 3.4 meters (11.5 feet / 138 inches) of erosion per year in the short-term but was relatively stable in the long-term.

Pismo Beach is an example of an area vulnerable to cliff erosion, where low bluffs consist of relatively weak sedimentary rock susceptible to wave erosion and undercutting of the cliff. The City of Pismo Beach conducted a Bluff Erosion Study in order to quantify historic erosion rates and evaluate impacts to coastal resources and development. Bluff retreat typically occurs episodically with several feet to several tens of feet of the bluff top eroded during a single season or storm event, while the bluff top in adjacent areas may remain unchanged. This bluff study estimates an approximate average retreat of 4 inches per year over the last 50 years. Retreat rates of only 2 inches per year were observed at relatively resistant south-facing bluffs. Retreat rate of 6 to 12 inches per year, however, were observed in areas with higher instability where there has been sea cave collapse (City of Pismo Beach 2002). Rapid bluff collapse that contributes to higher bluff erosion rates are difficult to predict and projected to increase with sea level rise. For example, an approximate 100-foot section of the Pismo Beach bluff collapsed following the winter storm season in March 2011, a much more rapid erosion rate than those reflected in historical records (Figure 5-37). The historic bluff retreat rates determined in this study did not consider increasing wave energy and sea level rise. Existing rates of annual erosion may only approximate future coastal erosion rates and associated hazard vulnerability.

Table 5-34 Historic Rates of Erosion at Specific Sections of the Coastline

Location	Historic Erosion ¹ Rate (inches/year)	Shoreline Characteristics
Cambria	2-3	Narrow beaches backed by low cliffs approximately 20 feet high with urban development and public parkland
Cayucos	6-10	Wider beaches backed by low cliffs approximately 20 feet high
Morro Bay	+60 ²	Large sand dunes backed by elevated terraces along a bay protected by a sandspit

Los Osos	4-6	Large sand dunes backed by developed areas
Port San Luis	Not Available	Sandy beach backed by cliffs up to 100 feet high, protected from northwesterly swells by the Port San Luis Breakwater
Pirates Cove	4-7	Offshore rocks and sea stacks backed by eroding cliffs approximately 30-100 feet high
Grover Beach	Not Available	Sandy beaches backed by low active dunes covered with vegetation, a golf course, and residential development
Oceano	Not Available	Wide sandy beaches backed by low active dunes
South County	Not Available	Sandy beaches backed by active dunes with sparse vegetative cover, high intermediate established dunes with vegetative cover, marshes and lakes.
Pismo Bluffs ³	2-12 (Average of 4 inches/year)	Relatively steep bluffs approximately 20 to 110 feet high fronted by narrow and steep beaches formed by bluff erosion.

¹ Historic rates of erosion describe the approximated change in shoreline position and/or bluff retreat calculated over the period from 1942 to 2002, and vary depending on geologic composition and exposure to wave energy (Hapke et. al 2006).

² Due to the construction of the Morro Bay Harbor Breakwater and the presence of Morro Rock, the littoral drift north of Morro Bay has been interrupted and the coast has extended seaward with increased beach width (San Luis Obispo County 1999).

³ Historical erosion rates of the Pismo Bluffs are based on evaluation of approximately 5 miles of coastline between Harloe Avenue and The Bluffs Drive in Pismo Beach (City of Pismo Beach 2002).

Figure 5-37 Bluff Erosion at Pismo Beach, March 2011



An approximate 100-foot section of cliff collapsed in Pismo Beach due to erosion of the bluff following winter storms in March 2011, demonstrating the severe impacts of coastal hazards on weak bluff sediments. Source: San Luis Obispo Tribune 2011

Hard shoreline protective structures (i.e. seawalls, revetments) are implemented in some areas to slow erosion; however, such structures become less effective during severe storms and high tide events. The efficacy of existing protection devices and natural barriers such as typically stable serpentine rock is expected to decrease with projected sea level rise. Substantial beach erosion and cliff collapse resulting from severe storms has occurred along the bluffs adjacent to Pacific Avenue and Studio Drive in Cayucos. Extensive blocks of sheared serpentine that normally serve to slow erosion were breached by intense

storm waves during a coastal storm event in March 1983. The bluff receded as much as 20 feet, causing severe beach and bluff erosion along the coast and irreparably damaged to coastal infrastructure (San Luis Obispo County 1999).

Severe coastal erosion also occurred at low-lying portions of Highway 1 near Piedras Blancas; from just north of the Piedras Blancas Lighthouse to the Arroyo de la Cruz Bridge. The temporary rock revetment armoring the road was not sufficient to protect the road from coastal storm and flood damage, and coastal erosion compromised the safety and structural integrity of the Highway. Approximately 2.8 miles of Highway 1 was relocated up to 475 feet landward in order to prevent coastal bluff erosion from adversely affecting future operation of the highway for the next 100 years (Figure 5-38) (Caltrans 2010).

Figure 5-38 Vulnerable Portions of Highway 1 and Realignment near Piedras Blancas



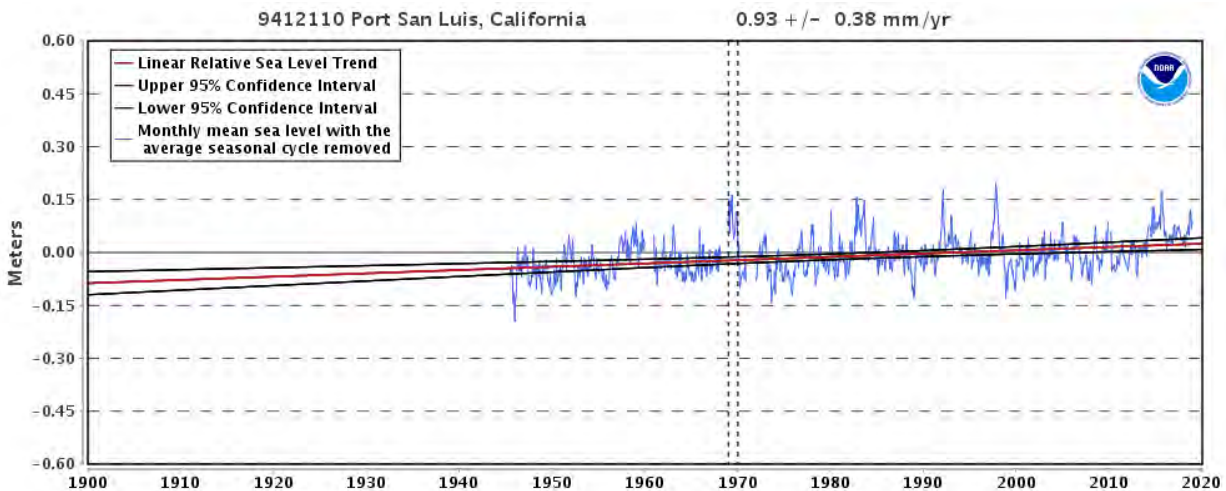
Low-lying portions of Highway 1 near are threatened by severe coastal erosion due to wave damage and insufficient protection from hard structures (pictured left). In response, an approximate 2.8 mile-long segment of Highway 1 near Piedras Blancas was realigned 475 feet inland to protect the roadway from future erosion (new roadway completed in 2017, pictured right) (Caltrans 2010).

Photo Source: San Luis Obispo Tribune 2014 (left); AP Photo/Danial Dreifuss (right)

Sea Level Rise: Sea levels are rising at different rates in different regions of the California Coast due to local differences in tectonic uplift/subsidence and other factors such as nearshore bathymetry. Typically, the highest sea level readings along California's coastline occur during periods of heavy rain that coincide with high tides, causing coastal flooding, coastal bluff erosion, and cliff collapses such as those experienced during the 1982/83 and 1997/98 El Niño events.

The Port San Luis Tide Gauge located on the Hartford Pier reports the local sea level rise rate at approximately 0.93 (+/-0.38) millimeters per year (mm/year) since 1948 (NOAA 2017) (Figure 5-39). This rate compares to the global average annual rate of 3.2mm/year (Griggs et. al. 2017) and near the mouth of San Francisco Bay that has recorded approximately 7 inches in sea level rise variation over the past 100 years. The monthly sea level tide gauge record at Port San Luis was at its lowest recorded level (-0.2 meters or -0.66 feet) in the 1940s and reached its highest measured monthly average in the late 1990s at approximately 0.2 meters (0.66 feet). The growth trend is projected to increase in future years (NOAA 2017).

Figure 5-39 Tide Record and Sea Level Rise Trend from Port San Luis Tide Gauge (NOAA Station 9412110)



Source: (NOAA 2019b)

Probability of Future Occurrences

Coastal Storm: Highly Likely. Coastal storms typically occur every winter season between the months of November and March. Coastal storms vary in frequency and severity and will be exacerbated by rising sea levels and future increase in variation in climate. The Federal Emergency Management Agency (FEMA) estimates and maps future coastal storms based on the 1-percent probability of an extreme storm occurring during any given year (FEMA 2019). Thus, extreme coastal storms occur less frequently. Increasing trends in coastal storm frequency and severity based on climate-related variables have also been identified by studies of cyclone frequency and wave height (see subsection 5.1.3 Climate Change Considerations of the base plan). The future occurrence of coastal storms is projected to increase; however, the projected frequency and intensity is difficult to quantify with current climate science and coastal storm modeling.

Coastal Erosion: Highly Likely. Average rates of historic beach and cliff erosion and shoreline retreat and are expected to continue and accelerate, but future erosion rates are difficult to project due to variable coastal processes and uncertainty in sea level rise projections. Increased frequency of coastal storms and wave run-up due to sea level rise increases the irreversible bluff erosion and cliff collapse that may occur.

Dunes and cliffs will exhibit differential responses to rising sea levels. The Pacific Institute models projected rates of coastal dune and cliff erosion in its "Erosion hazard with a 1.4-meter (4.6 foot) sea level rise, 2100" dataset, which represents the areas vulnerable to erosion with a sea level rise of 1.4 meters (4.6 feet) by 2100. This data is utilized in a larger study: *The Impacts of Sea-Level Rise on the California Coast*, which quantifies the projected impacts of coastal dune and bluff erosion (Heberger et. al 2009). This study projects a total dune and cliff erosion of 2.9 square miles (80.8 million square feet) with 1.4 meters (4.6 feet) of sea level rise by 2100. Projected rates of average and maximum dune and cliff retreat inform the severity of future erosion and impact on existing coastal development in close proximity to the shoreline (Table 5-35). These values project the total amount of erosion and average landward retreat of the county by 2100, and do not consider short-term responses of sandy beaches, dunes, and cliffs as a result of coastal storms (e.g., cliff failure due to severe wave attack). Dune and cliff erosion rates vary significantly

throughout due to geological composition and the physical forces acting on the coastline; therefore, actual erosion and shoreline retreat distance will not be uniform throughout the county. Further, areas protected by hard structures such as seawalls (i.e. Avila Beach) will also experience lesser impacts of cliff erosion than unaltered natural coastlines.

Actual future rates of erosion are relative to future coastal processes and difficult to project with certainty. Projected rates of erosion are naturally varied and will likely accelerate by 2100; thus, most erosion will occur towards the end of the century (Heberger et. al 2009).

Table 5-35 Coastal Erosion Projections with 1.4 meter (4.6 foot) Sea Level Rise by 2100

San Luis Obispo	Total Erosion Area ¹	Average Retreat Distance ²	Maximum Retreat Distance
Dune Erosion	1.4 square miles	150 meters / 492 feet	330 meters / 1083 feet
Cliff Erosion	1.5 square miles	78 meters / 256 feet	280 meters / 918 feet

¹ Total Erosion Area refers to the total area of dunes or cliff loss due to erosion projected to occur by 2100.

² Retreat Distance refers to the landward retreat of dunes or cliffs as a result of coastal erosion projected to occur by 2100.

Source: (Heberger et. al 2009).

Sea Level Rise: Likely. Scientific understanding of sea level rise is advancing at a rapid pace; projections of future sea level rise continue to change as new studies become available. Future climate change is projected to particularly affect sea levels as the glaciers, polar ice packs, and ice sheets retreat. The predicted sea level rise over the course of this century varies widely. Since 1992, trends in sea level rise have been monitored by satellites and recorded by tide gauges. Given the variables involved, it is not yet possible to determine the actual rate of sea level increase. The Ocean Protection Council (OPC) suggests that sea level rise along the coast of California could occur on the order of 0.5-1.0 foot by 2030, 1.0-2.6 feet by 2050, and 3.1-10 feet by 2100 (Table 5-36). These sea level rise scenarios are based on various projections of global greenhouse gas (GHG) emissions. The probabilities take into account uncertainties related to each of these scenarios. In addition, *Rising Seas in California: An Update on Sea-Level Rise Science* identifies an extreme sea level rise scenario (H++) that projects 10 feet of sea level rise by 2100 based on an accelerated rate of Arctic and Antarctic ice sheet loss (Griggs et. al. 2017). The H++ scenario assumes a trajectory of high GHG emissions and an accelerated rate of Arctic and Antarctic ice sheet loss. Note that there is a high level of uncertainty associated with the H++ scenario (as well as all SLR projections and projected timing) and given the emerging nature of SLR science, these estimates are intended to be used as a guide only and are subject to refinement over time. If this extreme sea level rise scenario were to occur, the modeled elevations of sea level rise and associated hazards could be experienced substantially sooner than the projected horizon year.

Table 5-36 Sea Level Rise Projections

Projected Horizon Year / Time	67% Probability SLR meets or exceeds	0.5% Probability SLR meets or exceeds	H++ Extreme SLR Scenario (no probability assigned)
2030	0.5 ft	0.7 ft	1.0 ft
2050	1.0 ft	1.8 ft	2.6 ft
2100	2.1-3.1 ft	5.4-6.7 ft	9.9.ft

Note: Probabilities based on projections by the OPC for both low and high GHG emissions scenarios (Griggs et. al. 2017).

Climate Change Considerations

As ocean temperatures warm as a result of climate change, the water in the ocean expands and occupies more volume, resulting in a rise in sea levels. In addition, global sea levels rise from the additional volume of water added to the oceans from the melting of mountain glaciers and ice sheets on land. The rate at which sea levels will rise is largely dependent on the melting of the ice, which changes the land cover from a reflective ice surface to open ocean water; the ocean continues to absorb more of the sun's energy and subsequently increases the rate of ice melt. The uncertainties associated with the rate at which ice melt occurs is largely responsible for the wide variation in sea level rise projections in the latter half of this century (i.e., between 2050 and 2100) and can explain the H++ scenario.

The time scales for sea level rise are related to complex interactions between the atmosphere and the oceans, delays in stabilizing GHG levels in the atmosphere, and the dissolution of those gases into the ocean. The Intergovernmental Panel on Climate Change (IPCC) has published scientific evidence that demonstrates that sea levels will be rising for the next several thousand years due to the GHGs that have already been released into the atmosphere. Much of the scientific advancement in recent years has been in understanding the contribution and rate of ice melt to global sea levels. It has also revealed the potential for extreme sea level rise resulting from rapid acceleration of ice melt as noted above under the RCP 8.5 and H++ scenarios. In general, the higher the GHG emissions, the higher the temperature, the more rapid the ice melt, and the higher the rate of sea level rise.

A study conducted to examine the variability of coastal storms in California using historical records of storms and tide gauge data in San Francisco identified an increasing trend in the frequency and intensity of coastal storms over the last 50 years (Bromierski et. al 2003). Increasing trends in climate-related variables have also been identified by studies of cyclone frequency (Graham & Diaz 2001) and wave height (Allan & Komar 2000); these have been substantially affected in the last two decades by increased coastal storm frequency and intensity. Continuation of these trends would have serious consequences for structures and ecosystems along the West Coast. The projected frequency and intensity of future coastal storms, however, is difficult to confidently quantify (Bromierski et. al 2003).

Vulnerability

The assessment of vulnerabilities to coastal storms, coastal erosion, and sea level rise within San Luis Obispo County relies on the best available science and modeling and methodology from a range of sources including FEMA and OPC planning guidance. Data was derived from several sources, including NOAA sea level rise viewer and previous studies that quantify historic rates of coastal erosion and frequency/severity of coastal storms and provide evidence for future trends (NOAA 2019b; USGS 2018). This assessment is further guided by FEMA's *Local Mitigation Planning Handbook* (2013), which provides strategies to describe and quantify hazards risk in the context of individual jurisdictions.

Sea level rise modeling and adaptation is an evolving field. The sea level rise projections used in studies previous to this Plan to identify vulnerabilities do not reflect the most recent update of California sea level rise guidance, as provided in the California *OPC 2018 State of California Sea-Level Rise Guidance Update* (OPC 2018). The NOAA Sea Level Rise and Coastal Flooding Impacts online tool uses a "bathtub" model comparing water elevations to ground elevation contours but may not fully account for hydrodynamics such as King Tides, storm surges or wave run-up, often key elements in coastal flooding. Spatial data layers within the CSMW WebMapper developed by the Pacific Institute (2009) also estimate areas that will be affected by future sea level rise; however, the data layers also use the "bathtub" model and do not

reflect the most recent sea level rise projections, which are substantially higher than those used within the Pacific Institute model. The CSMW WebMapper layers that identify areas vulnerable to bluff erosion and dune erosion hazards represent all dunes and bluffs as susceptible to sea level rise induced erosion with a 55-inch (4.6-foot) rise in sea level by 2100 (USACE 2016). The Pacific Institute spatial data layers provide projections for coastal bluff and cliff erosion in total area of erosion (square miles) and shoreline retreat (linear meters/feet) with sea level rise of 1.4 meters (4.6 feet) by 2100. Historic and projected rates of erosion inform future vulnerability of coastal development; however, erosion future rates are relative to variable coastal hazards and are difficult to quantify.

A San Luis Obispo California Polytechnic State University graduate study titled *A Sea Level Rise Vulnerability Assessment and Adaptation Strategies for the County of San Luis Obispo* completed to inform future updates of the Safety Element of the County's General Plan analyzed the potential impacts of coastal hazards and sea level rise to identify vulnerabilities along the coast (Protsman 2018). This study provides site-specific erosion rates and detailed maps of site-specific shoreline change and coastal hazards that utilizes USGS and Pacific Institute data (Protsman 2018; USGS 2018). USGS data provides information on coastal change hazards during storms, beach morphology during extreme storms, short-term and long-term shoreline change rates, a coastal vulnerability index, and probabilities of coastal shoreline retreat on a regional scale. USGS has a more localized and accurate model called the Coastal Storms Modeling System (CoSMoS), and this model had not yet been applied to San Luis Obispo County until mid-2019. As this modeling represents more current sea level rise science it was integrated into this HMP before it was finalized. This was also done to reflect the most recent update of California sea level rise guidance, as provided in the California *OPC 2018 State of California Sea-Level Rise Guidance Update* (OPC 2018).

The California Coastal Commission (CCC) requires sea level rise analysis and bluff retreat studies for new coastal development permits, which provide site-specific research on historic and projected rates of sea level rise and bluff erosion. Individual jurisdictions, such as the city of Pismo Beach, have also conducted sea level rise and bluff erosion studies to evaluate vulnerability and establish policies for reviewing proposed coastal development. Sea level rise studies and adaptation reports conducted for smaller jurisdictions include site-specific coastal modeling including the Morro Bay *Sea Level Rise Adaptation Strategy Report* (Moffat & Nichol 2018).

General Property

Public and private property vulnerable to coastal storms, coastal erosion, and sea level rise generally include low-lying coastal structures and those built close to the edge of eroding bluffs. Vulnerable private development primarily includes residential and commercial buildings in cities and unincorporated communities, as well as agricultural buildings in rural areas. Parcels located in close proximity to the coastline include agriculture and residential structures, commercial structures, industrial structures, agriculture and residential parcels, commercial parcels, and industrial parcels. (County of San Luis Obispo 2018; Protsman 2018). A property risk assessment conducted by Protsman (2018) determined that the buildings and parcels with the highest vulnerability are located within the central and northern regions of the coast due to health, safety, and displacement concerns of damaged or destroyed structures and parcels (Protsman 2018).

Coastal hazard impacts on coastal property are dependent on several factors including the elevation and composition of the shoreline (i.e. wide sandy beach versus a rocky intertidal beach fronting coastal bluffs).

For example, structures built adjacent to eroding bluffs are vulnerable to bluff erosion and coastal storms. Public and private property susceptible coastal storms and projected sea level rise may be protected through shoreline adaptation measures including hard structures such as seawalls or rock revetments or softer approaches such as beach nourishment that slow the landward retreat of the shoreline (USACE 2016). Natural features such as dune fields and coastal cliffs exist over much of the county coastline that are subject to irreversible beach and bluff erosion. However, less than 5 percent of the San Luis Obispo County coastline is estimated to be protected from coastal hazards with hard structures such as revetments or seawalls as of 2016 (USACE 2016).

Figure 5-40 Residential and Commercial Coastal Development in Morro Bay



Low-lying commercial and residential coastal development in Morro Bay is has little protection from coastal flooding and sea level rise; however, the strand and dunes across the bay provide some protection from strong offshore swells. Photo Source: San Luis Obispo Tribune 2014.

As an estimate of potential losses to coastal flooding a GIS analysis of exposure within FEMA coastal flood zones (VE) was completed. The GIS analysis takes into account improved values of properties and estimated content values. Approximately 64 properties worth \$3 million is currently exposed, including both improved and content value within Morro Bay, Pismo Beach, and unincorporated areas based on the intersection of improved parcel centers with VE flood hazard areas (Table 5-37). Note that the type of properties with the greatest exposure include a number of government/utilities and exempt properties that do not have valuations in the assessor's data, thus the property values are likely under-represented. The loss estimate assumes 50% of the structure and content exposure value due to the potential for deeper flooding and wave effects associated with the VE zones. The unincorporated areas, such as low-lying areas in Cayucos, are exposed to the highest total value and greatest loss estimate due to potential coastal flooding (Table 5-38). While this analysis generally shows relatively low risk to existing development, the risk could increase over time with sea level rise.

Table 5-37 Coastal Flooding Hazard Exposure – General Property Summary by Jurisdiction

Jurisdiction	Property Count	Improved Value	Content Value	Total Value	Loss Estimate	Population
MORRO BAY	11	\$5,724	\$0	\$5,724	\$2,862	-
PISMO BEACH	10	N/A	N/A	N/A	N/A	-
Unincorporated	43	\$2,016,245	\$1,008,123	\$3,024,368	\$1,512,184	8
TOTAL	64	\$2,021,969	\$1,008,123	\$3,030,092	\$1,515,046	8

Source: Parcel analysis by Wood.

Table 5-38 Coastal Flooding Hazard Exposure by Property Type

Property Type	Property Count	Improved Value	Content Value	Total Value	Loss Estimate	Population
Government/Utilities	48	--	--	N/A	N/A	--
Other/Exempt/Misc	10	--	--	N/A	N/A	--
Residential	1	\$968,412	\$484,206	\$1,452,618	\$726,309	3
Multi-Family Residential	1	\$972,774	\$486,387	\$1,459,161	\$729,581	3
Residential: Other	1	\$75,059	\$37,530	\$112,589	\$56,294	3
Vacant	3	\$5,724	--	\$5,724	\$2,862	--
TOTAL	64	\$2,021,969	\$1,008,123	\$3,030,092	\$1,515,046	8

Source: Parcel analysis by Wood.



Sea Level Rise Impact Analysis

A geographic information systems (GIS) overlay analysis was performed to determine parcels and critical facilities that may be affected by sea level rise. The GIS analysis method is the same in nature as that used with other hazard layers, which are used in an intersection process to determine whether a critical facility, shown as a point, or a developed parcel polygon, which is then converted to a centroid point to be more easily represented, either falls in or outside of each hazard area.

For this particular overlay analysis two sets of sea level rise inundation data were used, based upon currently available (August 2019) modeling representative of the best available science. The U.S. Geological Survey Coastal Storm Modeling System Version 3.1 (USGS CoSMoS 3.1) data provides detailed projections of tidal inundation and coastal flood hazards between Golden Gate Bridge in San Francisco Bay and Point Conception in Santa Barbara County. Projections show the modeled flood extents under both existing conditions, and ten (10) possible future sea level rise scenarios ranging from 25 cm to 500 cm. CoSMoS 3.1 is based on global climate models (GCMs) developed by the Intergovernmental Panel on Climate Change and considers region-specific factors such as oceanographic conditions, backshore types (beach, bluff or estuarine), long-term changes in the shoreline, river and stream drainages, wind patterns, and seasonal changes. The model identifies areas along the coast where significant flooding may occur under both a non-storm scenario and storm scenarios.

With CoSMoS 3.1 data, for each modeled increase in sea level elevation, there is a minimum, average and maximum range of uncertainty that is modeled. The maximum uncertainty scenario was used for the purposes of this analysis, which effectively models a worst-case scenario for each given SLR scenario.

The SLR analysis includes three ranges of sea level rise across two scenarios, one with 100-year flooding and one without. Sea level rise scenarios selected for analysis are based on projections for San Luis Obispo provided by the Ocean Protection Council *State of California Sea -Level Rise Guidance* (OPC 2018) under a worst case, or extreme risk aversion scenario (H++ scenario within Table 5-36 above). The H++ scenario was selected for analysis as the intent is to identify infrastructure and critical facilities that could be irreversibly damaged by sea level rise, or would be significantly costly to repair, and would have considerable impacts to public safety, health, or environmental resources. The first phase of analysis models property and critical facility exposure to an average maximum tidal inundation at these increments:

- Area extent of maximum tidal inundation with 25cm (approximately 1.0 ft) increase in sea level rise
- Area extent of maximum tidal inundation with 75cm (approximately 2.6 ft) increase in sea level rise
- Area extent of maximum tidal inundation with 300cm (approximately 9.9 ft) increase in sea level rise

These hazard zones show the projected maximum extent of what will be regularly flooded by tidal movements under the three sea level rise elevations.

The second scenario of analysis uses the same sea level rise elevations previously described but models the area extent of inundation associated with a 100-year coastal flood event (or 1% annual chance coastal flood including waves). The addition of the flooding worsens the extent of the overall inundation and represents how coastal and estuarine flooding will be exacerbated by sea level rise in the future.



- Area extent of flooding from 100-year coastal flood event with 25cm (approximately 1.0 ft) increase in sea level rise
- Area extent of flooding from 100-year coastal flood event with 75cm (approximately 2.6 ft) increase in sea level rise
- Area extent of flooding from 100-year coastal flood event with 300cm SLR (approximately 9.9 ft) increase in sea level rise

An exposure analysis was performed to identify the counts of improved properties, values of those properties, and critical facilities located within the six scenarios. The number of parcels and critical facilities were aggregated by parcel type and community (whether incorporated or instead a Community Services District or Special District) or critical facility type and category. Improved value totals were calculated by summing up all the improved values of the parcels of each type and in each community, as summarized in the following tables. As a clarification, improved values are the values of the developments, or improvements, not land value. The analysis does not predict damage loss, as property and content values may change in the future, and it is assumed that some property will eventually be relocated or removed prior to permanent inundation. The analysis does not account for undeveloped parcels that might be permanently inundated by sea level rise in the future. Note that the inundation events become progressively more extensive with the addition of the deeper sea level rise levels, thus property that is inundated in the 25cm and 75cm scenarios is also inundated in the 300cm scenario and are totaled as such.

The following results are aggregated into three main categories: incorporated jurisdictions, community service districts, and special districts. A total of six tables are provided, two for each category, that depict the count of exposed parcels and values of improvements on those parcels for the three sea level rise scenarios, both with and without the 100-year flood (Note: SLR stands for Sea Level Rise).

Table 5-39 Number of Parcels Inundated by Sea Level Rise, with and without a 1% Annual Chance Coastal Flood – Incorporated Jurisdictions

Location	Parcel Type	25-cm SLR	75-cm SLR	300-cm SLR	25-cm SLR w/ 1% Flood	75-cm SLR w/ 1% Flood	300-cm SLR w/ 1% Flood
Grover Beach	Commercial	--	--	6	--	--	6
	Government/Utilities	--	--	4	--	--	7
	Other/Exempt/Misc.	--	--	4	--	--	9
	Residential	--	--	2	--	--	15
	Multi-Family Residential	--	--	3	--	--	9
	Mobile/Manufactured Homes	--	--	--	--	--	1
	Industrial	--	--	1	--	--	3
TOTAL		0	0	20	0	0	50
Morro Bay	Commercial	--	-	12	-	-	50
	Government/Utilities	1	1	19	--	1	12
	Other/Exempt/Misc.	--	--	6	1	3	19
	Residential	--	1	12	--	--	9
	Residential: Other	--	-	3	1	1	76
	Vacant	1	1	3	--	1	4
TOTAL		2	3	55	3	7	124
Pismo Beach	Commercial	--	--	9	2	4	9
	Government/Utilities	1	1	12	4	5	13
	Other/Exempt/Misc.	--	1	18	1	6	22
	Residential	1	2	37	2	9	41
	Multi-Family Residential	--	--	93	--	6	104
	Mobile/Manufactured Homes	--	--	3	--	2	3



Location	Parcel Type	25-cm SLR	75-cm SLR	300-cm SLR	25-cm SLR w/ 1% Flood	75-cm SLR w/ 1% Flood	300-cm SLR w/ 1% Flood
	Residential: Other	--	--	7	--	--	13
	TOTAL	2	4	179	9	32	205
Unincorporated	Agricultural	--	--	4	3	3	4
	Commercial	--	2	46	4	15	59
	Government/Utilities	1	2	35	8	16	48
	Other/Exempt/Misc.	--	--	43	2	16	59
	Residential	--	14	434	30	92	563
	Multi-Family Residential	--	1	110	3	18	163
	Mobile/Manufactured Homes	--	--	2	--	--	2
	Residential: Other	1	1	39	3	14	47
	Vacant	--	--	21	1	13	25
	TOTAL	2	20	734	54	187	970

Source: USGS CoSMoS v3.1 (2019), San Luis Obispo Assessor's Office/GIS, ParcelQuest 2018, Wood Parcel Analysis.

Table 5-40 Improved Values of Properties Inundated by Sea Level Rise with and without a 1% Annual Chance Coastal Flood – Incorporated Jurisdictions

Location	Parcel Type	25-cm SLR	75-cm SLR	300-cm SLR	25-cm SLR w/ 1% Flood	75-cm SLR w/ 1% Flood	300-cm SLR w/ 1% Flood
Grover Beach	Commercial	--	--	\$834,388	--	--	\$834,388
	Government/Utilities*	--	--	--	--	--	--
	Other/Exempt/Misc.*	--	--	\$3,181,722	--	--	\$3,883,627
	Residential	--	--	\$198,637	--	--	\$1,675,517
	Multi-Family Residential	--	--	\$971,575	--	--	\$3,466,989
	Mobile/Manufactured Homes	--	--	--	--	--	\$305,343
	Industrial	--	--	\$62,392	--	--	\$107,956
	TOTAL	\$0	\$0	\$5,248,714	\$0	\$0	\$10,273,820
Morro Bay	Commercial	--	--	\$4,441,799	--	\$800,000	\$4,441,799
	Government/Utilities*	--	--	--	--	--	--
	Other/Exempt/Misc.*	--	--	\$74,906	--	--	\$74,906
	Residential	--	\$42,463	\$3,930,417	\$42,463	\$42,463	\$30,817,911
	Residential: Other	--	--	\$7,707,961	--	\$4,072,244	\$9,981,210
	Vacant	\$5,724	\$5,724	\$3,312,145	\$5,724	\$5,724	\$3,337,145
	TOTAL	\$5,724	\$48,187	\$19,467,228	\$48,187	\$4,920,431	\$48,652,971
Pismo Beach	Commercial	--	--	\$3,931,762	\$255,000	\$330,726	\$3,931,762
	Government/Utilities*	--	--	--	--	--	--
	Other/Exempt/Misc.*	--	\$2,214,828	\$3,727,316	\$2,214,828	\$2,349,497	\$3,727,316
	Residential	\$174,047	\$176,839	\$6,468,297	\$176,839	\$3,056,157	\$6,933,545
	Multi-Family Residential	--	--	\$22,908,703	--	\$1,255,367	\$24,617,998
	Mobile/Manufactured Homes	--	--	\$17,059,909	--	\$16,215,406	\$17,059,909
	Residential: Other	--	--	\$13,124,415	--	--	\$17,033,080
	TOTAL	\$174,047	\$2,391,667	\$67,220,402	\$2,646,667	\$23,207,153	\$73,303,610
Unincorporated	Agricultural	--	--	\$286,564	\$120,863	\$120,863	\$286,564
	Commercial	--	\$546,320	\$11,955,715	\$981,159	\$3,759,287	\$16,209,339
	Government/Utilities*	--	\$8,491,063	\$26,751,762	\$8,491,063	\$8,552,857	\$26,921,391
	Other/Exempt/Misc.*	--	--	\$13,477,246	\$645,000	\$5,987,495	\$19,278,257
	Residential	--	\$2,323,098	\$83,336,297	\$4,859,099	\$21,089,501	\$110,892,058
	Multi-Family Residential	--	\$125,465	\$15,885,589	\$693,107	\$5,211,282	\$30,108,820
	Mobile/Manufactured Homes	--	--	\$343,452	--	--	\$343,452
	Residential: Other	\$75,059	\$75,059	\$16,669,622	\$2,084,548	\$10,138,380	\$34,731,855
	Vacant	--	--	\$3,616,752	\$10,404	\$2,958,652	\$6,135,235
	TOTAL	\$75,059	\$11,561,005	\$172,322,999	\$17,885,243	\$57,818,317	\$244,906,971

*Values may be underestimated as some values not available in parcel data due to being exempt from tax assessment.

Source: USGS CoSMoS v3.1 (2019), San Luis Obispo Assessor's Office/GIS, ParcelQuest 2018, Wood Parcel Analysis.



Table 5-41 Number of Parcels Inundated by Sea Level Rise with and without a 1% Annual Chance Coastal Flood – Community Service Districts

Location	Parcel Type	25-cm SLR	75-cm SLR	300-cm SLR	25-cm SLR w/ 1% Flood	75-cm SLR w/ 1% Flood	300-cm SLR w/ 1% Flood
Avila Beach	Commercial	--	--	10	--	8	12
	Government/Utilities	--	--	7	1	6	7
	Other/Exempt/Misc.	--	--	13	--	12	14
	Residential	--	--	14	--	9	15
	Multi-Family Residential	--	--	19	--	15	28
	Residential: Other	--	--	10	--	10	11
	Vacant	--	--	13	--	11	16
TOTAL		0	0	86	1	71	103
Los Osos	Commercial	--	2	12	3	5	15
	Government/Utilities	--	--	1	--	1	1
	Other/Exempt/Misc.	--	--	1	1	1	1
	Residential	--	14	222	28	71	294
	Multi-Family Residential	--	-	4	--	-	10
	Mobile/Manufactured Homes	--	-	1	--	-	1
	Residential: Other	1	1	3	3	3	3
	Vacant	--	-	2	1	2	2
TOTAL		1	17	246	36	83	327
Oceano	Agricultural	--	-	1	--	-	1
	Commercial	--	-	9	--	-	13
	Government/Utilities	--	--	10	--	--	10
	Other/Exempt/Misc.	--	-	17	--	-	20
	Residential	--	-	145	--	-	162
	Multi-Family Residential	--	-	71	--	-	76
	Mobile/Manufactured Homes	--	-	1	--	-	1
	Residential: Other	--	-	20	--	-	24
	Vacant	--	-	2	--	-	2
TOTAL		0	0	276	0	0	309
San Simeon	Government/Utilities	--	-	-	1	1	1
	Multi-Family Residential	--	-	-	--	-	21
	Other/Exempt/Misc.	--	-	-	--	-	3
TOTAL		0	0	0	1	1	25
Cambria	Government/Utilities	--	--	--	--	--	4
	Other/Exempt/Misc.	1	1	1	1	1	1
	Residential	--	--	7	--	--	30
TOTAL		1	1	8	1	1	35

Source: USGS CoSMoS v3.1 (2019), San Luis Obispo Assessor's Office/GIS, ParcelQuest 2018, Wood Parcel Analysis.



Table 5-42 Value of Improved Values of Properties Inundated by Sea Level Rise and 1% Annual Chance Coastal Flood – Community Service Districts

Location	Parcel Type	25-cm SLR	75-cm SLR	300-cm SLR	25-cm SLR w/ 1% Flood	75-cm SLR w/ 1% Flood	300-cm SLR w/ 1% Flood
Avila Beach	Commercial	--	--	\$4,744,109	--	\$2,427,671	\$6,267,359
	Government/Utilities*	--	--	\$61,794	--	\$61,794	\$61,794
	Other/Exempt/Misc.*	--	--	\$5,342,495	--	\$5,342,495	\$7,605,508
	Residential	--	--	\$5,286,138	--	\$4,001,139	\$5,394,363
	Multi-Family Residential	--	--	\$5,157,029	--	\$4,518,175	\$8,464,474
	Residential: Other	--	--	\$7,193,724	--	\$7,193,724	\$22,050,689
	Vacant	--	--	\$3,248,427	--	\$2,937,427	\$5,744,835
TOTAL		\$0	\$0	\$31,033,716	\$0	\$26,482,425	\$55,589,022
Los Osos	Commercial	--	\$546,320	\$2,243,469	\$744,960	\$883,510	\$2,544,092
	Government/Utilities*	--	--	--	--	--	--
	Other/Exempt/Misc.*	--	--	\$420,000	\$420,000	\$420,000	\$420,000
	Residential	--	\$2,323,098	\$41,957,596	\$4,462,878	\$12,338,675	\$55,511,993
	Multi-Family Residential	--	--	\$1,264,339	--	--	\$3,120,843
	Mobile/Manufactured Homes	--	--	\$62,149	--	--	\$62,149
	Residential: Other	\$75,059	\$75,059	\$2,084,548	\$2,084,548	\$2,084,548	\$2,084,548
	Vacant	--	--	\$21,225	\$10,404	\$21,225	\$21,225
TOTAL		\$75,059	\$2,944,477	\$48,053,326	\$7,722,790	\$15,747,958	\$63,764,850
Oceano	Agricultural	--	--	\$165,701	--	--	\$165,701
	Commercial	--	--	\$1,558,192	--	--	\$2,094,953
	Government/Utilities*	--	--	\$0	--	--	\$0
	Other/Exempt/Misc.*	--	--	\$2,891,663	--	--	\$3,045,326
	Residential	--	--	\$23,372,714	--	--	\$26,784,979
	Multi-Family Residential	--	--	\$6,749,991	--	--	\$8,992,923
	Mobile/Manufactured Homes	--	--	\$281,303	--	--	\$281,303
	Residential: Other	--	--	\$2,792,785	--	--	\$4,238,793
	Vacant	--	--	\$242,315	--	--	\$242,315
TOTAL		\$0	\$0	\$38,054,664	\$0	\$0	\$45,846,293
San Simeon	Government/Utilities	--	--	--	--	--	\$0
	Multi-Family Residential	--	--	--	--	--	\$4,274,750
	Other/Exempt/Misc.	--	--	--	--	--	\$0
TOTAL		\$0	\$0	\$0	\$0	\$0	\$4,274,750
Cambria	Government/Utilities*	--	--	--	--	--	--
	Other/Exempt/Misc.*	--	--	--	--	--	--
	Residential	--	--	\$2,255,769	--	--	\$10,685,000
TOTAL		\$0	\$0	\$2,255,769	\$0	\$0	\$10,685,000

*Values may be underestimated as some values not available in parcel data due to being exempt from tax assessment.

Source: USGS CoSMoS v3.1 (2019), San Luis Obispo Assessor's Office/GIS 2018, ParcelQuest, Wood Parcel Analysis.



Table 5-43 Number of Parcels Inundated by Sea Level Rise with and without 1% Annual Chance Coastal Flood – Special Districts

Location	Parcel Type	25-cm SLR	75-cm SLR	300-cm SLR	25-cm SLR w/ 1% Flood	75-cm SLR w/ 1% Flood	300-cm SLR w/ 1% Flood
Cayucos Sanitation District	Commercial	--	-	15	1	2	19
	Government/Utilities	--	--	11	4	6	14
	Other/Exempt/Misc.	--	-	10	1	3	12
	Residential	--	-	46	2	12	83
	Multi-Family Residential	--	1	16	3	3	28
	Residential: Other	--	-	6	--	1	8
	Vacant	--	-	3	--	-	3
TOTAL		0	1	107	11	27	167
Port San Luis Harbor District	Government/Utilities	1	2	5	2	4	5
	Other/Exempt/Misc.	--	--	1	--	--	1
TOTAL		1	2	6	2	4	6
South San Luis Obispo County Sanitation**	Agricultural	--	--	1	--	-	1
	Commercial	--	--	15	--	-	19
	Government/Utilities	--	--	13	--	-	16
	Other/Exempt/Misc.	--	--	21	--	-	29
	Residential	--	--	147	--	-	177
	Multi-Family Residential	--	--	74	--	-	85
	Mobile/Manufactured Homes	--	--	1	--	-	2
	Residential: Other	--	--	20	--	-	24
	Industrial	--	--	1	--	-	3
	Vacant	--	--	2	--	-	2
TOTAL		0	0	295	0	0	358

Source: USGS CoSMoS v3.1 (2019), San Luis Obispo Assessor's Office/GIS, ParcelQuest 2018, Wood Parcel Analysis.

Table 5-44 Improved Values of Properties Inundated by Sea Level Rise with and without a 1% Annual Chance Coastal Flood – Special Districts

Location	Parcel Type	25-cm SLR	75-cm SLR	300-cm SLR	25-cm SLR w/ 1% Flood	75-cm SLR w/ 1% Flood	300-cm SLR w/ 1% Flood
Cayucos Sanitation District	Commercial	--	--	\$3,409,945	\$236,199	\$448,106	\$5,302,935
	Government/Utilities*	--	--	\$0	--	--	\$169,629
	Other/Exempt/Misc.*	--	--	\$4,823,088	\$225,000	\$225,000	\$6,418,638
	Residential	--	--	\$11,574,166	\$396,221	\$4,749,687	\$21,631,681
	Multi-Family Residential	--	\$125,465	\$2,714,230	\$693,107	\$693,107	\$5,255,830
	Residential: Other	--	--	\$4,598,565	--	\$860,108	\$5,444,156
	Vacant	--	--	\$104,355	--	--	\$104,355
TOTAL		\$0	\$125,465	\$27,224,349	\$1,550,527	\$6,976,008	\$44,327,224
Port San Luis Harbor District	Government/Utilities*	--	\$8,491,063	\$26,689,968	\$8,491,063	\$8,491,063	\$26,689,968
	Other/Exempt/Misc.*	--	--	--	--	--	--
TOTAL		\$0	\$8,491,063	\$26,689,968	\$8,491,063	\$8,491,063	\$26,689,968
South San Luis Obispo County Sanitation**	Agricultural	--	--	\$165,701	--	--	\$165,701
	Commercial	--	--	\$2,392,580	--	--	\$2,929,341
	Government/Utilities*	--	--	\$0	--	--	\$0
	Other/Exempt/Misc.*	--	--	\$6,073,385	--	--	\$6,928,953
	Residential	--	--	\$23,571,351	--	--	\$28,460,496
	Multi-Family Residential	--	--	\$7,721,566	--	--	\$12,459,912
	Mobile/Manufactured Homes	--	--	\$281,303	--	--	\$586,646
	Residential: Other	--	--	\$2,792,785	--	--	\$4,238,793
	Industrial	--	--	\$62,392	--	--	\$107,956
	Vacant	--	--	\$242,315	--	--	\$242,315
TOTAL		\$0	\$0	\$43,303,378	\$0	\$0	\$56,120,113

*Values may be underestimated as some values not available in parcel data due to being exempt from tax assessment.

**Note that South SLO Sanitation District encompasses the Cities of Grover Beach and Arroyo Grande as well as the majority of the Oceano CSD. As such, the totals for the Sanitation District may be duplicative when compared to the other cities' and the CSD's totals.

Source: USGS CoSMoS v3.1 (2019), San Luis Obispo Assessor's Office/GIS, ParcelQuest 2018, Wood Parcel Analysis.



The results of the parcel analysis are projected estimates based on available data and modeling results, which are subject to change based on the actual rate of sea level rise and the frequency and duration of coastal storms. Sea level rise alone is not anticipated to be the primary cause of damage, but rather, sea level rise exacerbates existing coastal hazards, including damage caused by severe storms and the frequency, duration, and extent of tidal flooding. Further, this analysis assumes no adaptation nor mitigation strategies are in place; implementation of future mitigation strategies may minimize these impacts.

The parcel analysis indicates the greatest vulnerability from sea level rise is within the unincorporated areas of the County and incorporated areas of Pismo Beach and Morro Bay. The results do not show any property at risk within Grover Beach, which is largely set-back further and has less coastal development. Both Morro Bay and Pismo Beach have relatively low vulnerability to the 25cm and 75cm tidal inundation scenarios, but vulnerability increases significantly with a 300cm scenario. Combined with a 300cm and 100-year coastal flood scenario, the property at risk nearly doubles for Morro Bay.

The unincorporated areas of the County have the most overall vulnerability in terms of counts and values of improved parcels. The majority of these vulnerable areas are located in the community service districts of Los Osos, Oceano, Avila Beach, Cayucos and Cambria.

Regarding the community service districts (CSD), Los Osos, Oceano, and Avila Beach have the greatest number of improved parcels potentially vulnerable to sea level rise. All three communities have significant counts of developed parcels in the 300cm inundation level, both with and without the 100-year flood.

In terms of improved parcel impacts the Port San Luis Harbor District, South San Luis Obispo County Sanitation District and Cayucos Sanitation District is more vulnerable to the 300cm inundation level, with relatively minor impacts to the smaller levels of inundation. Note that the South San Luis Obispo County Sanitation District has overlap with Oceano and the Grover Beach. The values of property at risk for the Port San Luis Harbor District include two piers, with values provided by the District. There is potential for other property and infrastructure in the District to be at risk that is not accounted for due to limitations in the asset database.

People

Some populations are more vulnerable to coastal erosion, coastal flooding, and sea level rise impacts due to having certain sensitivities, an increased likelihood of exposure, or a lower adaptive capacity (Public Health Institute Center for Climate Change and Health 2016). Demographic characteristics including health conditions that affect physical ability and health, or socioeconomic factors that amplify risk factors for poor health conditions, may affect the abilities of individuals or households to prepare for, respond to, and recover from coastal hazards (EPA 2017). Specific attributes may create additional stresses on individuals and communities resulting in reduced resiliency in the event of a coastal hazard event. Many of these factors may also be exacerbated by the specific, localized nature of flooding, erosion, and other impacts associated with sea level rise.

Social Vulnerability

Coastal areas with a high social vulnerability index inform which communities are more susceptible to adverse impacts of coastal storms, flooding, and sea level rise. Based on the SoVI data presented and

discussed in subsection 4.4.1, populations along the coastline that are most socially vulnerable to coastal hazards are identified as Grover Beach, Oceano, and San Simeon.

A San Luis Obispo California Polytechnic State University graduate study titled *A Geospatial Assessment of Social Vulnerability to Sea-Level Rise in Coastal San Luis Obispo County* was also referenced as another source for a preliminary assessment of social vulnerability exposure (Carpentier 2017). This study focused on the unincorporated areas only, and suggests higher social vulnerability in San Simeon, Cambria, and Avila Beach.

Based on 2000 U.S. Census Bureau data and coastal floodplain modeling, the estimated population of the county vulnerable to a 1-percent-annual-chance extreme coastal flood event is approximately 670 people (Heberger et. al 2009). A 1.4-meter (4.6-foot) increase in sea level rise is projected to increase the number of people in the county vulnerable to a 100-year coastal flood event to approximately 1,300, resulting in a 98% increase in the affected population. Of these, 85% identify as white, including white Hispanics, and 13% identify as a minority race. Additionally, approximately 45% of this vulnerable group is considered low-income (<\$30,000/year) (CEC 2012). An additional 1,100 people are vulnerable to erosion-related risk along the coast as a result of 1.4 meter (4.6-foot) sea level rise.

Critical Facilities and Infrastructure

Critical facilities that are vulnerable to coastal hazards and sea level rise may include public transportation, wastewater treatment and water supply infrastructure, schools, law enforcement facilities, and community centers. Essential education facilities such as the Morro Bay High School and Coast Union High School may be subject to coastal storms and flooding exacerbated by future sea level rise. Coastal erosion also threatens the structural foundation of schools built close to the shoreline such as Shell Beach Elementary School. Law Enforcement Facilities that are in close proximity to the shoreline such as in Pismo Beach and Oceano are also vulnerable to coastal storms and flooding. Additional vulnerable facilities include the Cambria wastewater treatment plant and municipal wells in Santa Rosa and San Simeon Creeks, the Children's Center and the Avila Beach Community Center, each of which is located within a low-lying area subject to potential inundation during a coastal storm.

Regional and local-serving public and utility infrastructure vulnerable to coastal hazards and sea level rise include roads, bridges, railroad lines and crossings, wastewater treatment plants, culverts, water lines, communication line and towers, stormwater outlets, bike lanes, bike facilities, airports, and fiber optic lines. Utility infrastructure containing hazardous materials that are vulnerable to coastal hazards and sea level rise include hazardous material facilities, the Diablo Canyon Nuclear Power Plant, underground tanks, and Regional Water Quality Control Board clean-up sites (Protsman 2018). Facilities that are impacted by coastal hazards could also result in a release of hazardous materials or deteriorating water or air quality, as well as disruption to key public and utility services to the wider community. Such vulnerable facilities include:

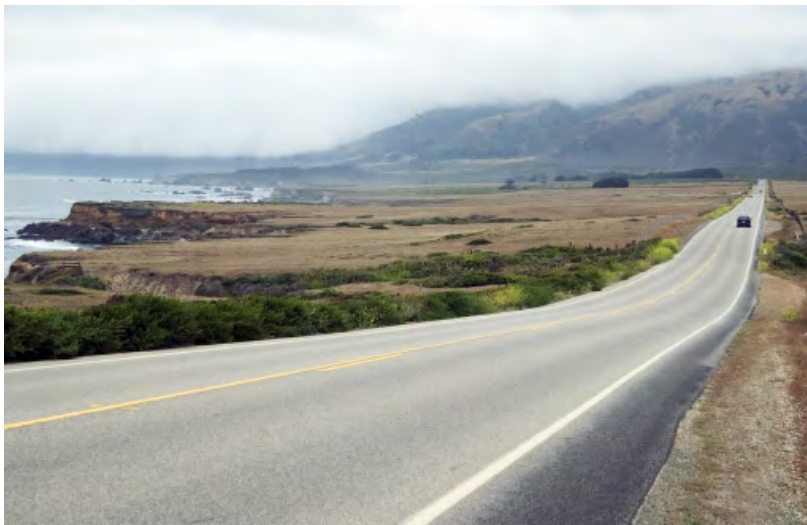
- The Diablo Canyon Power Plant
- San Simeon Wastewater Treatment Plant
- Cayucos Sanitary District
- Cambria Community Services District Municipal Water Wells
- Cambria Community Services District Wastewater Treatment Plant
- Oceano Wastewater Treatment Plant



- City of Morro Bay Wastewater Treatment Plant
- Oceano County Airport

Low-lying transportation infrastructure is vulnerable to the impacts of coastal hazards, including roads in Cayucos, Avila Beach, portions of the Southern Pacific Railroad, and sections of Highway 1 and Highway 101 (Caltrans 2018a). Highway 1 was found to be potentially vulnerable to inundation, flooding, and bluff erosion hazards as a result of sea level rise (Figure 5-41), as existing shore protection is either absent or easily overwhelmed by overtopping waves (Moffat & Nichol 2018). Approximately 2.8 miles of Highway 1 at Piedras Blancas north of San Simeon was recently relocated inland due to past and future threatened damage from coastal bluff erosion.

Figure 5-41 Low-lying Portions of Highway 1 in San Luis Obispo County



Currently, low-lying sections of Highway 1 in San Luis Obispo County are vulnerable to coastal hazards such as erosion and inundation from coastal storms and sea level rise; a segment. Source: (Caltrans 2018b)

Wastewater treatment plants for coastal communities located in low-lying areas along coastal streams may be vulnerable to coastal hazards and projected sea level rise. For example, while the Cambria Community Services District and Oceano wastewater treatment plants are both located more than 1,500 feet from the shoreline, their location in low-lying coastal stream valleys may make them vulnerable to the combination of fluvial flooding and tidal inundation associated with projected sea level rise. In addition, coastal community municipal wells, such as CCSD wells along San Simeon and Santa Rosa Creeks are located near the coast and may be vulnerable to sea level rise-related inundation or possible future salt water intrusion. Hazardous materials facilities such as underground gas tanks and known hazardous cleanup sites equate to higher potential losses because damage to such structures may implicate leaked chemicals that pose impacts to health and safety (Protsman 2018).

Sea Level Rise Analysis on Critical Facilities

Exposure of 11 critical facilities to sea level rise is noted in the following tables; all of these with the exception of one are not at risk until the 300cm level of inundation. Wastewater treatment plants potentially at risk include the Morro Bay/Cayucos WWTP, San Simeon WWTP, and South San Luis Obispo County WWTP; San Simeon's WWTP is most vulnerable and at risk to 100-year coastal flooding with the 25cm SLR scenario. Table 5-45 summarizes the critical facilities based on sea level rise inundation type

and location, while Table 5-46 includes additional details on these facilities (facility name, address, type of facility, and category of the facility).

Table 5-45 Critical Facilities in Sea Level Rise Areas by Facility Category and Location

Facility Location	Facility Category	Total Facilities – SLR of 25cm	Total Facilities – SLR of 75cm	Total Facilities – SLR of 300cm	Total Facilities – SLR of 25cm + 100-year flood	Total Facilities – SLR of 75cm + 100-year flood	Total Facilities – SLR of 300cm + 100-year flood
Morro Bay	Emergency Services	--	--	1	--	--	1
	High Potential Loss Facilities	--	--	1	--	--	1
	Lifeline Utility Systems	--	--	5	--	--	5
TOTAL		0	0	7	0	0	7
San Simeon	Lifeline Utility Systems	--	--	--	1	1	1
TOTAL		0	0	0	1	1	1
Cayucos	--	--	--	1	--	--	1
TOTAL		0	0	1	0	0	1
South San Luis Obispo Sanitation District and Oceano	Lifeline Utility Systems	--	--	1	--	--	1
Oceano	Transportation Systems	--	--	1	--	--	1
TOTAL		0	0	2	0	0	2
GRAND TOTAL		0	0	10	1	1	11

Source: USGS CoSMoS v3.1, San Luis Obispo Planning & Building/GIS, HIFLD, SLO County Community Service Districts and Special Districts, Wood Parcel Analysis.



Table 5-46 Critical Facilities in Sea Level Rise Areas by Facility Category and Location

Facility Location	Facility Name	Facility Address	Facility Category	Facility Type
Morro Bay	Morro Bay/Cayucos Wastewater Treatment Plant	160 Atascadero Road	Lifeline Utility Systems	Wastewater Treatment Plant
	Microwave Service Tower	Morro Bay Power Plant	Lifeline Utility Systems	Microwave Service Towers
	Microwave Service Tower	Not Available	Lifeline Utility Systems	Microwave Service Towers
	Microwave Service Tower	Not Available	Lifeline Utility Systems	Microwave Service Towers
	Morro Bay Electrical Substations	PG&E	Lifeline Utility Systems	Energy Commission Substations
	Morro Bay Power Plant	Dynegy, Inc.	High Potential Loss Facilities	Power Plants
	Morro Bay High School	235 Atascadero Rd	Emergency Services	Public Schools
Cayucos	Cayucos Fire Protection District	201 Cayucos Drive	Emergency Services	Fire Stations
San Simeon	San Simeon Wastewater Treatment Plant	9245 Balboa Ave	Lifeline Utility Systems	Wastewater Treatment Plant
South San Luis Obispo Sanitation District and Oceano	South San Luis Obispo Sd Wastewater Treatment Plant	1600 Aloha Pl	Lifeline Utility Systems	Wastewater Treatment Plant
Oceano	Oceano County Airport	Oceano	Transportation Systems	Airport

Source: USGS CoSMoS v3.1, San Luis Obispo Planning & Building/GIS, HIFLD, SLO County Community Service Districts and Special Districts, Wood Parcel Analysis.

Economy

The major economic industries in San Luis Obispo County by employment include tourism, retail, service industries, government, and agriculture (Moser, Ekstrom 2012). Developed areas of the San Luis Obispo coast that are important to tourism include Cambria/Moonstone Beach, Cayucos, Morro Bay, Port San Luis/Avila Beach, and Pismo Beach (USACE 2016). Although the most popular beaches are located in the southern part of the county, beach tourism is important throughout the county (USACE 2016). However, projected climate change and sea level rise could cause an overall reduction of economic value in beach visitation. Some beaches may potentially lose attendance and associated earnings due to loss of beach resulting from beach erosion, while others may experience increased attendance and beach-related earnings as beaches elsewhere become less usable for recreation (Moser and Ekstrom 2012). Vertical and lateral beach access points may also be affected by coastal erosion and inundation due to sea level rise, which would prevent residents and visitors from accessing the beach and may increase the risk of injuries (Protsman 2018).

Beach tourism is important to the county's economy and generates significant revenue as many visitors rent hotels or other accommodations, dine out or shop at area stores. Visitor-serving areas such as those in Oceano, Cambria, and Avila Beach include local businesses and hotels that benefit the local economy (Protsman 2018). These businesses depend on tourism, and cities and communities within San Luis Obispo benefit from sales tax revenues. Disruption of these areas due to impacts of coastal hazards and projected sea level rise could decrease economic activity and affect the local economy.

Future coastal beach and bluff erosion in the county may also negatively impact coastal businesses and households and decrease coastal real estate opportunities. Coastal bluff failure due to coastal erosion can create hazardous conditions due to roadway collapse, undermined home foundations and damage to



utilities (Russell & Griggs 2012). Natural resources with recreational and economic value may also be adversely affected. The county supports some of the largest dune habitats in the State including Morro Bay State Park, Oceano Dunes Natural Preserve, and the Guadalupe-Nipomo Dunes, which are vulnerable to damages from coastal storms and erosion. As this vulnerability increases over time, damages may impact the economy of the area and impact viable coastal land uses. Coastal storms can also cause erosion impacts and severe flooding and inundation of economically important infrastructure such as harbors and buildings related to commercial and recreational fisheries (Moser and Ekstrom 2012).

Historic, Cultural, and Natural Resources

Historic resources along the coast include designated historic sites and points, county-designated Sensitive Resource Areas and Archeological Resource Areas, county and State Parks, and other important habitat resource areas (Protsman 2018). Historic resources close to the coastline include museums such as the Morro Bay Maritime Museum, Museum of Natural History, and the Oceano Depot Museum. Historic resources also include coastal features such as recreational piers in Cayucos, Pismo, Avila and the Point San Luis Lighthouse, and the restored historic warehouse at the foot of Harford Pier in Port San Luis Harbor (Port San Luis Harbor District 2007). Cayucos Pier is considered a historic property in the VE coastal 100-year flood zone.

One of the most visually prominent historic natural landmarks immediately vulnerable to coastal hazards and sea level rise is Morro Rock. Morro Rock stands approximately 576 feet tall and was created from a volcanic plug. The area is a significant cultural and religious monument, as it was once the site of Chumash sacred rituals (City of Morro Bay 2018). Morro Rock is a protected State Historic Landmark (#821) that also provides nesting habitat for peregrine falcons, a previously endangered and currently fully protected species (Department of Fish and Wildlife 2019).

Figure 5-42 Morro Bay and Morro Rock



Morro Rock is a historical, cultural, and natural landmark at the mouth of Morro Bay that also provides nesting habitat for Peregrine Falcons. Photo Source: Morrobay.org 2019

The county's coastline includes a variety of natural habitats including sandy beaches, subtidal soft-bottom, rocky tide pools, offshore reefs, bays, estuaries, and harbors (USACE 2016). These include several managed areas and protected habitats, including the State Marine Conservation Areas (SMCA), State Marine Reserves (SMR), State Marine Recreational Management Area (SMRMA), state parks and beaches, and state game refuges. These areas support ecologically significant habitats where endangered or threatened species occur, including designated critical habitat and nesting and foraging sites for shorebirds. State parks and beaches within the San Luis Obispo County coastline include Cayucos State Beach, Estero Bluffs State Park, Los Osos Oaks State Reserve, Montaña de Oro State Park, Morro Bay State Park, Morro Strand State Beach, Harmony Headlands State Park, Hearst San Simeon State Park, and the W.R. Hearst Memorial State Beach (Department of Parks and Recreation 2019).

Figure 5-43 Estero Bluffs State Park, Cayucos



The Estero Bluffs State Park has a variety of natural resources including intertidal areas, native grasslands, wetlands, low bluffs, and coastal terraces with hiking trails and 3 miles of beach, which is vulnerable to coastal hazards (Department of Parks and Recreation 2019).

The combined influence of sea level rise and coastal hazards may result in a migration of habitat inland and to higher elevations, or a transition to a different habitat type. With this consideration, there may be development or other impediments to inland migration that may result in the net loss of habitat. For example, accelerated erosion of the Oceano Dunes may cause this habitat may migrate inland. If a freshwater wetland is exposed to rising tides, it will transition to a saline estuarine wetland. The faster the climate changes, the more difficult it will be for animal species to migrate and for floral habitats to re-establish elsewhere. Nevertheless, some of the more resilient species may adapt in place.

Future Development

Land use and development along the county's shoreline is governed by the California Coastal Act. Regulations under the Coastal Act are typically administered by the county and local cities through adopted Local Coastal Plans, overseen by the California Coastal Commission (California Coastal Commission 2019; County of San Luis Obispo 2018). The California Coastal Commission mandates that a site-specific sea level rise analysis and bluff retreat study are performed to obtain a coastal development

permit for new development. Planning for proposed bluff-top development must assess the average long-term beach and bluff retreat rate, erosion rate due to various sea level rise scenarios, and erosion potential from 100-year storms and other extreme events. Bluff retreat studies must establish a “development setback” that creates a buffer behind which development would be protected from bluff erosion for a minimum of 75 years.

The county and each incorporated city’s certified Local Coastal Plans govern land use planning and development permitting. The county’s General Plan, including the *Framework for Planning- Coastal Zone* guides development in unincorporated areas. The Estero Area Plan, North Coast Area Plan, San Luis Bay Coastal Area Plan, Port San Luis Harbor District Port Master Plan, and the South County Coastal Area Plan provide area specific guidance (County of San Luis Obispo 2019c). Each city also as a certified Local Coastal Plan which governs land use and permitting with the coastal areas of the cities.

Risk Summary

Coastal storms are a recurring hazard for San Luis Obispo County that impact the entire coastline. Wave run-up erodes the coastline at varying rates depending upon geological composition. Development located in proximity to the shoreline is most vulnerable to coastal hazards and sea level rise; however, impacts are variable. Residential development is most susceptible to damage from coastal bluff erosion due to cliff collapse and shoreline retreat. Low-lying development and infrastructure fronted by sandy beaches however, are most vulnerable to dune erosion and impacts of sea level rise.

Coastal Storms:

- Coastal storms impact the entire coastline, causing beach and bluff erosion and coastal flooding of low-lying areas.
- Proximity of structures to the coastline increases vulnerability to the effects of coastal storms, coastal erosion, and sea level rise.

Coastal Erosion:

- The County of San Luis Obispo coastline’s geologic composition and exposure to wave energy is quite varied. Sections of the coast range from rocky coastline to sandy beaches backed by cliffs, to sandy beaches backed by sand dunes. These differing characteristics affect erosion characteristics as well.
- Short-term coastal erosion (e.g., cliff failure) occurs episodically, mainly during periods of intense wave action that coincides with high tides and coastal storms.
- Annual rates of coastal erosion range from about three inches a year to more than one foot a year depending on coastline composition and exposure to coastal hazards.
- Some of the potentially most vulnerable structures in the county are bluff top homes and business that are exposed to bluff erosion in the communities of San Simeon, Cayucos, Cambria and Pismo Beach. Public streets that border the coastal bluffs can also be subject of erosion damage.
- Portions of communities are low-lying which can expose public facilities such as wastewater treatments plans to costal flood hazards.
- Both bluff erosion and coastal flooding are exacerbated during major El Niño events such as the 2015-2016 El Niño event.
- Coastal storm flooding hazards are limited throughout much of the county, while those from bluff erosion range from moderate to significant for bluff top homes and facilities.

Sea Level Rise:

- Future projected sea level rise may affect potential hazards in the county and is projected based on the best available science and modeling.
- Rising sea levels alone are not anticipated to be the primary cause of vulnerabilities and potential damages to resources, property and infrastructure within San Luis Obispo County.
- Impacts may instead be caused by existing severe storm coastal process-related hazards increasing in frequency and duration as a result of sea level rise.
- If sea levels continue to rise at higher projected rates, episodic coastal erosion and coastal flooding impacts that already occur during large storm wave events could become more frequent, as predictable high tides may regularly inundate public beaches and low-lying coastal infrastructure.
- *Effects on people and housing:* Historically, there has been little or no loss of life or injury in San Luis Obispo County due to coastal storms. The primary impacts have been economic in nature.
- *Effects on commercial and industrial structures:* As beaches erode, the amount of recreational beach available to the public is substantially reduced. Changes in beach geometry can alter the wave characteristics of a particular site. Beach erosion results in the loss of sand from coastal areas. This hazard can accelerate the rate of erosion of coastal bluffs and can also contribute to increased wave-related damage to coastal structures.
- *Effects on infrastructure:* Erosion of beach sand removes the natural barrier that protects landforms and structures from the potentially destructive wave action. The end result can be the direct destruction of roads, homes, and other structures by waves whose force is no longer dissipated by wide beaches.
- *Related Hazards:* Adverse Weather, Flooding

Table 5-47 Coastal Storm/Coastal Erosion/Sea Level Rise Hazard Risk Summary

Jurisdiction	Geographic Extent	Probability of Future Occurrence	Magnitude/Severity	Overall Significance
San Luis Obispo County	Limited	Likely	Limited	Medium
City of Arroyo Grande	N/A	N/A	N/A	N/A
City of Atascadero	N/A	N/A	N/A	N/A
City of Grover Beach	Limited	Occasional	Limited	Low
City of Morro Bay	Extensive	Likely	Critical	High
City of Paso Robles	N/A	N/A	N/A	N/A
City of Pismo Beach	Significant	Occasional	Limited	Medium
City of San Luis Obispo	N/A	N/A	N/A	N/A
Avila Beach CSD	Significant	Likely	Limited	Medium
Ground Squirrel Hollow CSD	N/A			
Heritage Ranch CSD	N/A			
Los Osos CSD	Significant	Likely	Limited	Low
Nipomo CSD	N/A			
San Miguel CSD	N/A			
San Simeon CSD	Significant	Likely	Limited	Low



Jurisdiction	Geographic Extent	Probability of Future Occurrence	Magnitude/Severity	Overall Significance
Templeton CSD	N/A			
Cayucos Sanitary District	Significant	Likely	Limited	Medium
Port San Luis Harbor District	Significant	Highly Likely	Limited	High
San Luis Obispo FCWCD	Limited	Likely	Limited	Medium
South San Luis Obispo Sanitation District	N/A			



5.3.8 Dam Incidents

Hazard/Problem Description

Dams are manmade structures built for a variety of uses, including flood protection, power generation, agriculture, water supply, and recreation. When dams are constructed for flood protection, they usually are engineered to withstand a flood with a computed risk of occurrence. For example, a dam may be designed to contain a flood at a location on a stream that has a certain probability of occurring in any one year. If prolonged periods of rainfall and flooding occur that exceed the design requirements, that structure may be overtopped and fail. Overtopping is the primary cause of earthen dam failure in the United States. Dam failures can also result from any one or a combination of the following causes:

- Earthquake
- Inadequate spillway capacity resulting in excess overtopping flows
- Internal erosion caused by embankment or foundation leakage or piping or rodent activity
- Improper design
- Improper maintenance
- Negligent operation
- Failure of upstream dams on the same waterway

Water released by a failed dam generates tremendous energy and can cause a flood that is catastrophic to life and property. A catastrophic dam failure could challenge local response capabilities and require evacuations to save lives. Impacts to life safety will depend on the warning time and the resources available to notify and evacuate the public. Major loss of life could result as well as potentially catastrophic effects to roads, bridges, and homes. Associated water quality and health concerns could also be issues. Factors that influence the potential severity of a full or partial dam failure are the amount of water impounded; the density, type, and value of development and infrastructure located downstream; and the speed of failure.

Controlled release or spillway flooding: inadequate spillway capacity often results in excess overtopping flows, though the potential for flooding as a result of discharge from dam outlet structures or spillways could be expected during excessive rain events. However, controlled releases of water from dams is a measure that can prevent or minimize spillway flooding or structure failure, by regulating capacity in a managed way. Even controlled releases can lead to unwanted or unpredicted flooding, depending on environmental and weather conditions, or even human error.

In general, there are three types of dams: concrete arch or hydraulic fill, earth-rockfill, and concrete gravity. Each type of dam has different failure characteristics. A concrete arch or hydraulic fill dam can fail almost instantaneously: the flood wave builds up rapidly to a peak then gradually declines. An earth-rockfill dam fails gradually due to erosion of the breach: a flood wave will build gradually to a peak and then decline until the reservoir is empty. And, a concrete gravity dam can fail instantaneously or gradually with a corresponding buildup and decline of the flood wave.

Geographic Area

According to the California Department of Water Resources' Jurisdictional Dams as well as the National Inventory of Dams databases there are dams in the County constructed for flood control, irrigation storage, recreation, and stock watering purposes. The combined state and federal dataset identifies 15



dams, located in or upstream of the County of San Luis Obispo. Of these dams, ten are considered high hazard, three as significant hazards, one as a low hazard, and one as undetermined hazard. The San Antonio Dam is located just north of San Luis Obispo County, within Monterey County, while Twitchell is on the boundary between Santa Barbara and San Luis Obispo Counties; however, they pose a threat to San Luis Obispo County since they are on drainages that flow into the County. Table 5-48 details the high and significant hazard dams affecting the County of San Luis Obispo. The majority of these dams are in the Salinas and Central Coastal watersheds, with one being located in the Cuyama watershed, all in the central and west portions of the county. Both incorporated and unincorporated areas are at risk of damage from flooding in the event of a dam failure, however, Atascadero, the City of San Luis Obispo, and the central portions of the unincorporated county are at greater risk due to being more largely urban or more directly downstream/below the dams on the valley floor. Besides the 13 high or significant hazard dams noted below, the Las Tablas Creek dam is rated as a low hazard structure, with 180 acre-feet of storage capacity and 37 feet in height, while the Klau Dam is undetermined hazard rating-wise, only having a 50 acre-feet of storage capacity and being 45 feet in height.

Table 5-48 County of San Luis Obispo Dams of Concern Characteristics

Hazard Rating	Dam Name	Drainage	Downstream Community	Dam Type	Dam Height (in Feet)	Storage Capacity (Acre-Feet)	Emergency Operations Plan?
High	Atascadero Park	Tr Atascadero Creek	Atascadero	Earth	18	250	No
High	Chorro Creek	Chorro Creek	Camp San Luis Obispo	Earth	77	90	No
Significant	Eagle Ranch	Hale Creek	Atascadero	Earth	55	300	No
Significant	Hartzell	Santa Rita Creek	Atascadero	Earth	50	300	Yes
High	Lopez	Arroyo Grande Creek	Arroyo Grande	Earth	166	52,500	No
High	Nacimiento	Nacimiento River	Bradley	Earth	255	470,000	Yes
High	Righetti	W Corral De Piedra	Edna	Earth	83	735	No
High	Salinas Dam	Salinas River	Santa Margarita	Concrete	135	43,200	Yes
High	San Antonio	San Antonio River	Bradley	Earth	202	350,000	No
Significant	San Marcos	San Marcos Creek	Paso Robles	Earth	42	325	Yes
High	Terminal	Tr Arroyo Grande	Arroyo Grande	Earth	53	844	No
High	Twitchell	Cuyama River	Santa Maria	Earth	241	398,120	Yes
High	Whale Rock	Old Creek	Cayucos	Earth	193	40,662	Yes

Source: National Inventory of Dams, 2018; California Department of Water Resources – Jurisdictional Sized Dams, 2018

Note: 1 acre-foot = 325,851 gallons

Figure 5-44 illustrates the locations of identified dams of concern within the County, including their major drainages, while Figure 5-45 displays the dam inundation areas for eight of the ten high hazard dams in the county.



Figure 5-44 Dams of Concern to San Luis Obispo County

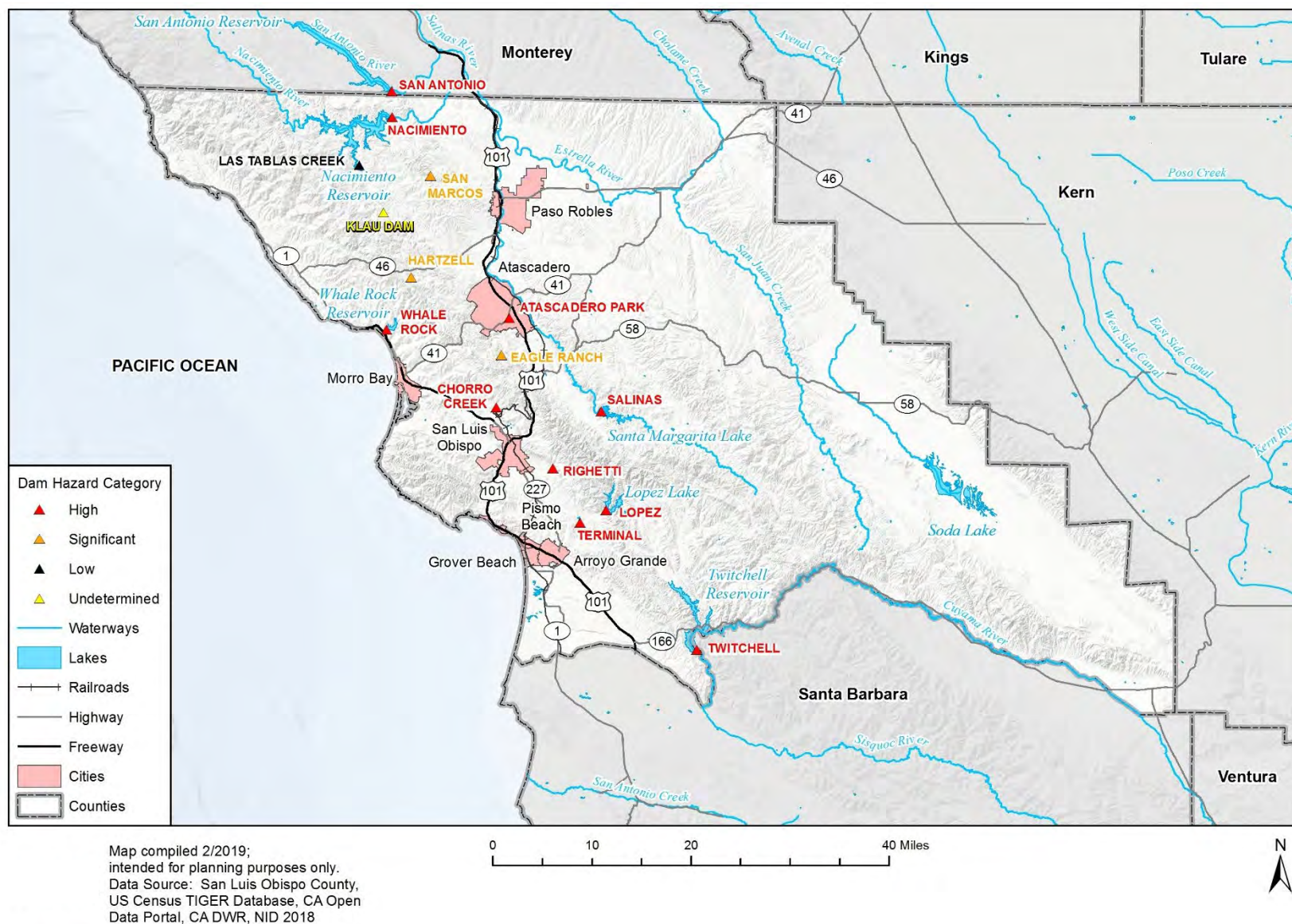
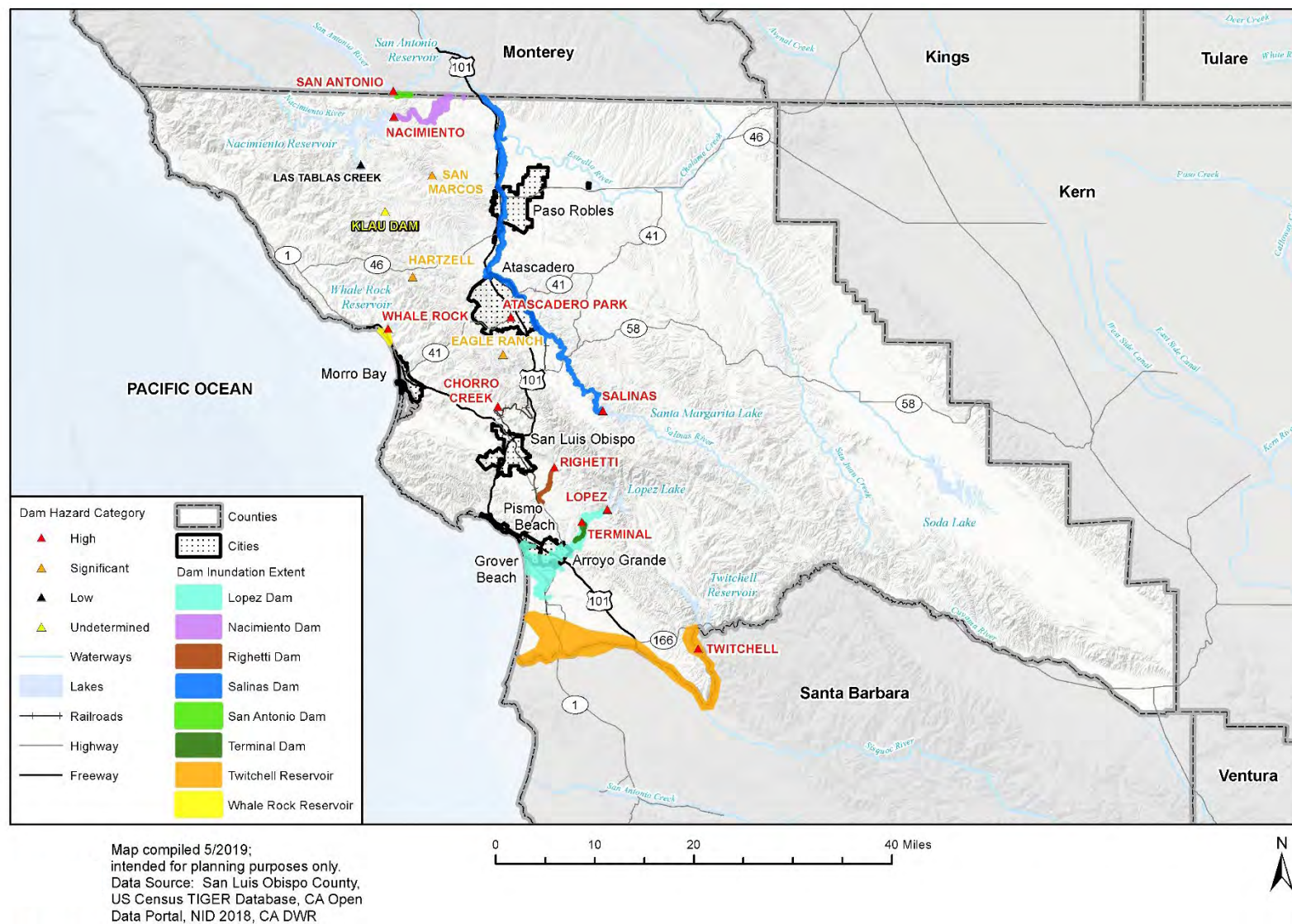


Figure 5-45 Dam Inundation Areas in San Luis Obispo County



Extent (Magnitude/Severity)

Standard practice among federal and state dam safety offices is to classify a dam according to the potential impact a dam failure (breach) or mis-operation (unscheduled release) would have on downstream areas. The hazard potential classification system categorizes dams based on the probable loss of human life and the impacts on economic, environmental and lifeline facilities. Dams are classified in three categories that identify the potential hazard to life and property:

- High hazard indicates that a failure would most probably result in the loss of life;
- Significant hazard indicates that a failure could result in appreciable property damage;
- Low hazard indicates that failure would result in only minimal property damage and loss of life is unlikely.
- Undetermined hazard dams have not been rated or their hazard rating is not known

Since the County has several High and Significant hazard dams, there is potential for loss of life and property damage. Both unincorporated and incorporated areas of the County are identified on dam failure inundation maps included in the County's Dam and Levee Failure Evacuation Plan, last updated on February of 2016, and also displayed in Figure 5-45. The inundation areas for each of the dams are generally downstream and include large rural and urban areas on the valley floor below the dams. Adjacent jurisdictions could also be affected by a dam failure in San Luis Obispo County. These include, depending on the dam involved and to a limited extent, the Counties of Monterey and Santa Barbara.

The extent of impacts depends on the nature of failure and location of the dam. The largest populations potentially at risk would be in Arroyo Grande, Grover Beach, Pismo Beach, Paso Robles, and Atascadero. Unincorporated areas across the county, particularly running through the Salinas River, east of the Nacimiento Reservoir, and west of the Twitchell Reservoir, would also be impacted were a dam to fail and flood downstream.

Past Occurrences

There is no history of dam failure affecting the county, but there have been recurring issues with flooding due to high flows released below dams in the area.

Events in 1969, 2006, 2011, 2017, Nacimiento Area/Heritage Ranch Community Service District (HRCSD) - Heavy rains on several occasions have led to flooding, which led to filling of the Nacimiento Reservoir to capacity. High flow releases from the dam by Monterey County Water Resources Agency (MCWRA) was necessary to relieve pressure on the dam. HRCSD's only potable water system is a fourth of a mile downstream from the dam and has been destroyed once and damaged at least two other times by these high flow releases. The high release in 1969 caused very significant damage to downstream property prior to construction of HRCSD facilities. Destruction of HRCSD Gallery Wells (water system intake facilities) did take place in the 2011 event, and damage of the same on at least two other occasions (2006 and 2017). The District noted costs associated with replacement and repair of infrastructure, additional water treatment necessary to compensate for loss of treatment efficiency due to temporary intake facilities during reconstruction, damage from scour and removal of gallery well filter media during at least two other high flow events (HRCSD 2019 HMP Update Workbook). The replacement value of the water treatment and distribution system is \$18.1 million.

Probability of Future Occurrences

Unlikely—The County remains at risk to dam failures from numerous dams under a variety of ownership and control and of varying ages and conditions. However, based on historical experience and HMPC input, dam failure is unlikely in the area. Nevertheless, given the number of dams of concern in the County the potential exists for future dam failures in San Luis Obispo County, but the likelihood of this is low. Uncontrolled or controlled release flooding as well as spillway flooding below dams due to excessive rain or runoff are more likely to occur than failures.

Climate Change Considerations

The potential for climate change to affect the likelihood of dam failure is not fully understood at this point in time. With a potential for more extreme precipitation events a result of climate change, this could result in large inflows to reservoirs. However, this could be offset by generally lower reservoir levels if storage water resources become more limited or stretched in the future due to climate change, drought and/or population growth.

Vulnerability

A dam incident can range from a small, uncontrolled release to a catastrophic failure. Vulnerability to dam failures is confined to the areas and populations subject to inundation downstream of the facility. Secondary losses would include loss of the multi-use functions of the dam itself and associated revenues that accompany those functions.

The Central Coast Tribune News for the County of San Luis Obispo yielded the following information (summarized in Figure 5-46) on potential dam failures and how they would affect nearby communities, based on dam inundation data from the San Luis Obispo County Office of Emergency Services (Tribune Staff, 2017). However, parcel analysis was carried out with the latest datasets from the county as well as assessor's office improvement values and ParcelQuest provided spatial layers, to overlay each dam inundation layer with the parcels to arrive at total parcels exposed, loss estimates, and populations at risk. The dam inundation areas by high hazard dam in the county are displayed in Figure 5-45 and the results of the parcel analysis explained in more detail in the sections below.

Figure 5-46 Dam Inundation Impacts to Downstream Communities in San Luis Obispo County

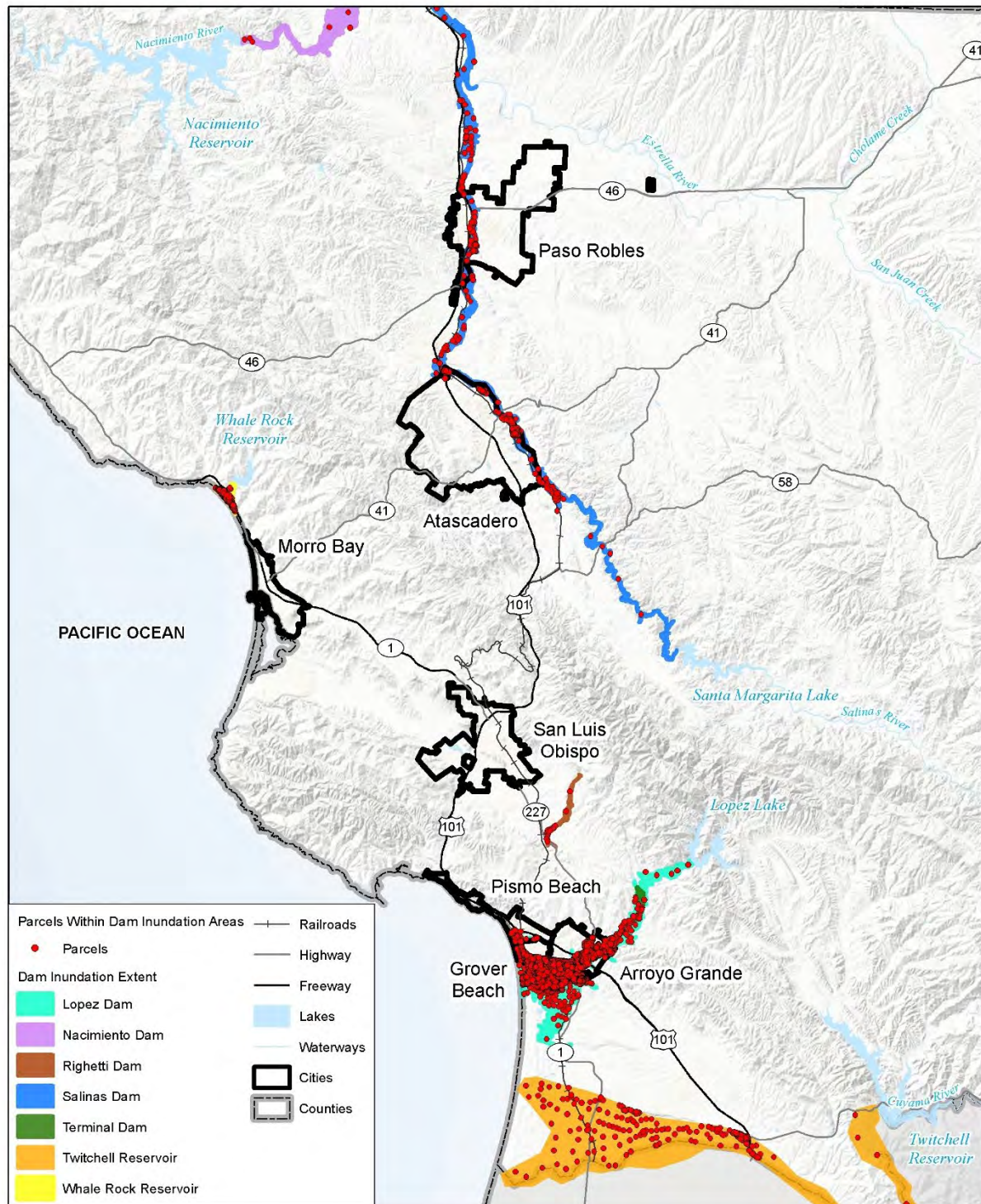


General Property

In general, communities located below a high or significant hazard dam and along a waterway are potentially exposed to the impacts of a dam failure. For reference, high hazard dams threaten lives and property, significant hazard dams threaten property only. Inundation maps that identify anticipated flooded areas (which may not coincide with known floodplains) are produced for all high hazard dams and are contained in the Emergency Action Plan (EAP) required for each dam. A GIS layer that contained inundation maps for eight of the ten high hazard dams that affect the County was analyzed to quantify risk across the planning area. Table 5-49, Table 5-50 and Table 5-51 summarize the estimated losses calculated from tallying up the parcels' improved and content values (more details on the parcel analysis methodology under the Asset Summary section). The loss estimate percentage used for dam failure inundation is 50% of a parcel's total value.

Figure 5-47 displays the parcels found to overlay with the dam inundation layer. According to the analysis of the dams with a potential to impact the planning area the Lopez Dam has the greatest potential downstream impacts coupled with a relatively short time to evacuate downstream areas. The Whale Rock, Salinas, and Twitchell dams also pose significant threats should a failure occur. Some jurisdictions are more at risk to dam failure than others. The cities of Arroyo Grande, Grover Beach, portions of the unincorporated areas are the most vulnerable. Atascadero, Pismo Beach, and Paso Robles also have a high hazard dams located upstream of them. The failure of any of these dams would cause downstream flooding and would likely result in loss of life and property. The potential magnitude of a dam failure depends on the time of year and the base flow of the river when the failure occurs. During the winter months, when the river flows are higher, the impact to the area would be much greater and evacuation times even shorter.

Figure 5-47 **Parcels Within Dam Inundation Areas in San Luis Obispo County**



Map compiled 3/2019;
intended for planning purposes only.
Data Source: San Luis Obispo County,
US Census TIGER Database, CA Open
Data Portal, ParcelQuest

Table 5-49 Dam Inundation Estimated Losses by Jurisdiction and Dam

Jurisdiction	Dam	Parcel Count	Improved Value	Content Value	Total Value	Loss Estimate	Population
Arroyo Grande	Lopez	3,565	\$681,052,289	\$356,141,266	\$1,037,193,555	\$518,596,777	8,273
Atascadero	Salinas	181	\$28,803,852	\$16,315,428	\$45,119,280	\$22,559,640	399
Grover Beach	Lopez	2,392	\$417,358,957	\$217,731,586	\$635,090,543	\$317,545,272	5,319
Paso Robles	Salinas	68	\$34,219,768	\$22,658,110	\$56,877,878	\$28,438,939	58
Pismo Beach	Lopez	66	\$33,076,320	\$15,020,878	\$48,097,198	\$24,048,599	113
Unincorporated	Lopez	2,333	\$362,698,180	\$181,512,103	\$544,210,283	\$272,105,141	5,125
	Nacimiento	7	\$144,774	\$69,426	\$214,200	\$107,100	3
	Righetti	16	\$12,694,743	\$6,339,437	\$19,034,180	\$9,517,090	38
	Salinas	116	\$19,560,321	\$9,493,807	\$29,054,128	\$14,527,064	201
	Terminal	11	\$2,336,587	\$1,157,154	\$3,493,741	\$1,746,870	20
	Twitchell	224	\$37,806,448	\$22,799,265	\$60,605,713	\$30,302,856	183
	Whale Rock	643	\$129,036,238	\$64,260,893	\$193,297,131	\$96,648,565	1,556
	Lopez	3,565	\$681,052,289	\$356,141,266	\$1,037,193,555	\$518,596,777	8,273
TOTAL		9,622	\$1,758,788,477	\$913,499,350	\$2,672,287,827	\$1,336,143,914	21,287

Source: San Luis Obispo County Planning and Building Dept., Assessor's Office, ParcelQuest, Wood Plc Parcel Analysis

Table 5-50 Dam Inundation Estimated Losses by Property Type

Property Type	Parcel Count	Improved Value	Content Value	Total Value	Loss Estimate	Population
Agricultural	101	\$14,469,017	\$14,469,017	\$28,938,034	\$14,469,017	--
Commercial	314	\$105,608,490	\$105,608,490	\$211,216,980	\$105,608,490	--
Government/Utilities	227	\$75,984	--	\$75,984	\$37,992	--
Other/Exempt/Misc.	379	\$60,173,041	--	\$60,173,041	\$30,086,521	--
Residential	6,627	\$1,145,400,771	\$572,700,386	\$1,718,101,157	\$859,050,578	16,634
Multi-Family Residential	999	\$223,706,043	\$111,853,022	\$335,559,065	\$167,779,532	2,507
Mobile/Manufactured Homes	55	\$33,945,009	\$16,972,505	\$50,917,514	\$25,458,757	138
Residential: Other	800	\$150,192,292	\$75,096,146	\$225,288,438	\$112,644,219	2,008
Industrial	27	\$11,199,857	\$16,799,786	\$27,999,643	\$13,999,821	--
Vacant	93	\$14,017,973	--	\$14,017,973	\$7,008,987	--
TOTAL	9,622	\$1,758,788,477	\$913,499,350	\$2,672,287,827	\$1,336,143,914	21,287

Source: San Luis Obispo County Planning and Building Dept., Assessor's Office, ParcelQuest, Wood Plc Parcel Analysis

Table 5-51 Dam Inundation Estimated Losses by Dam

Dam	Parcel Count	Improved Value	Content Value	Total Value	Loss Estimate	Population
Lopez	8,356	\$1,494,185,746	\$770,405,832	\$2,264,591,578	\$1,132,295,789	18,830
Nacimiento	7	\$144,774	\$69,426	\$214,200	\$107,100	3
Righetti	16	\$12,694,743	\$6,339,437	\$19,034,180	\$9,517,090	38
Salinas	365	\$82,583,941	\$48,467,345	\$131,051,286	\$65,525,643	658
Terminal	11	\$2,336,587	\$1,157,154	\$3,493,741	\$1,746,870	20
Twitchell	224	\$37,806,448	\$22,799,265	\$60,605,713	\$30,302,856	183
Whale Rock	643	\$129,036,238	\$64,260,893	\$193,297,131	\$96,648,565	1,556
TOTAL	9,622	\$1,758,788,477	\$913,499,350	\$2,672,287,827	\$1,336,143,914	21,287

Source: San Luis Obispo County Planning and Building Dept., Assessor's Office, ParcelQuest, Wood Plc Parcel Analysis



Dam failure flooding would vary by community depending on which dam fails and the nature and extent of the dam failure and associated flooding. Based on the risk assessment, it is apparent that a major dam failure could have a devastating impact on the planning area. Dam failure flooding presents a threat to life and property, including buildings, their contents, and their use. Large flood events can affect crops and livestock as well as lifeline utilities (e.g., water, sewerage, and power), transportation, jobs, tourism, the environment, and the local and regional economies.

People

Persons located underneath or downstream of a dam are at risk of a dam failure, though the level of risk can be tempered by topography (specifically where populations are located within the inundation path of a dam), amount of water in the reservoir and time of day of the breach. Injuries and fatalities can occur from debris, bodily injury and drowning. Once a dam has breached, standing water presents all the same hazards to people as floodwater from other sources. People in the inundation area may need to be evacuated, cared for, and possibly permanently relocated. Impacts could include thousands of evacuations and likely hundreds of casualties, depending on the dam involved. Specific population impacts are noted in Table 5-49, Table 5-50, and Table 5-51, and total people at risk were calculated by multiplying the average number of persons per household in the county of San Luis Obispo (2.51) times the number of residential parcels where dam inundation occurs. An incident at the Lopez dam would potentially put the most people at risk, followed by the Whale Rock and Salinas dams.

Social Vulnerability

The inundation paths of the Lopez and Salinas dams not only put the most people at risk, they will also potentially impact the communities of Grover Beach (Lopez dam) and Paso Robles (Salinas dam). Both communities are among the areas with the highest ranking of overall social vulnerability in the county based on the SoVI data presented and discussed in subsection 4.4.1. Public outreach and education on dam incidents as well as ensuring alert and warning systems are working properly should be focused in these areas.

Critical Facilities

A total dam failure can cause catastrophic impacts to areas downstream of the water body, including critical infrastructure. Any critical asset located under the dam in an inundation area would be susceptible to the impacts of a dam failure. Of particular risk would be roads and bridges that could be vulnerable to washouts, further complicating response and recovery by cutting off impacted areas. Risk to specific facilities could be considered sensitive information additional details can be found within the San Luis Obispo County's Dam and Levee Failure Evacuation Plan, updated as of February 2016.

Table 5-52 summarizes the number and types of critical facilities found to be at risk of dam failure incidents from the Lopez and Nacimiento Lake Dams, given no other dams' inundation extents cross the path of key facilities or structures in the county. These results were found by performing overlay analysis of the critical facilities and the dam inundation layers in GIS. Most of these facilities at risk (13) are found in Arroyo Grande, with another 13 in the unincorporated portions of the county and 8 in Grover Beach. Overall, a total of 34 critical facilities are found within dam inundation zones across the county.

Note that 33 of the 34 critical facilities found in dam inundation areas fall under the Lopez Dam extents, while only 1 (a water treatment facility in the Heritage Ranch Community Services District, in the unincorporated portion of the County, falls under the Nacimiento Lake Dam inundation extent).

Table 5-52 Critical Facilities in the Lopez Dam and Nacimiento Lake Dam Inundation Areas, by Type of Facility and Dam Name

Jurisdiction	Critical Facility Type	Count
ARROYO GRANDE	Day Care Facilities	3
	Emergency Medical Service Stations	1
	Fire Stations	1
	Hospitals	2
	Nursing Homes	2
	Private Schools	1
	Public Schools	3
TOTAL		13
GROVER BEACH	Day Care Facilities	2
	Microwave Service Towers	2
	Private Schools	1
	Public Schools	2
	Water Treatment Facilities	1
TOTAL		8
UNINCORPORATED	Day Care Facilities	4
	Emergency Medical Service Stations	1
	Fire Stations	1
	Local Law Enforcement	1
	Public Schools	1
	Wastewater Treatment Plant	1
	Airport	1
	Energy Commission Facilities	1
	Water Treatment Facilities (1 in Lopez Dam area and 1 in Nacimiento Lake Dam area)	2
TOTAL		13
GRAND TOTAL		34

Source: San Luis Obispo County Planning & Building Department, HIFLD, San Luis Obispo County Community Services Districts, Wood GIS analysis

Economy

Extensive and long-lasting economic impacts could result from a major dam failure including the long-term loss of water in a reservoir after a failure event. A major dam failure and loss of water from the associate reservoir could include direct business and industry damages and indirect disruption of the local economy.

Historic, Cultural, and Natural Resources

Dam failure effects on the environment would be similar to those caused by flooding from other causes. Water could erode stream channels and topsoil and cover the environment with debris. For the most part the environment is resilient and would be able to rebound from whatever damages occurred, though this process could take years. However, historic and cultural resources could be affected just as housing or critical infrastructures would, were a dam to fail and cause downstream inundation that could further

erode surfaces or cause scouring of structural foundations. GIS analysis indicates the following 3 historic properties are potentially at risk to dam inundation.

Table 5-53 Historic and Cultural Properties in Dam Inundation Areas, San Luis Obispo County

Name	Year	Area Plan	Dam Causing Inundation
Southern Pacific Railroad Depot	--	San Luis Bay Area Plan-Inland	Lopez
Coffee T. Rice House	1886	San Luis Bay Area Plan-Coastal	Lopez
Temple of The People, Halcyon	1903	San Luis Bay Area Plan-Inland	Lopez

Source: County of San Luis Obispo Planning and Building Dept., 2019

Future Development

Areas slated for future development should take into consideration potential impacts from dam failure risk upstream and should attempt to overlay the existing dam inundation maps with proposed future development. In the case of a dam failure, inundation would likely follow some existing FEMA mapped floodplains, which contains development restrictions for areas in the 1% annual chance floodplain, but it could exceed those floodplains and affect areas that are not regulated for flood hazards. Also of note is that development below a low or undetermined hazard dam could increase its hazard rating, though there is only one low hazard and one undetermined hazard dam in the County (while the majority are high or significant hazard dams). Finally, added development could compromise dams and reservoir resources if populations depend on them for critical needs such as potable water during or after a dam failure event. For example, the Nacimiento Reservoir is the only source of potable water within the Heritage Ranch Community Services District, and were this reservoir and dam to fail, the growing residential population would be potentially affected by dam inundation, resource damages, and lack of necessary potable water.

For this plan, a GIS overlay analysis of building construction permits for residential and commercial properties was additionally performed across the county, pulling from permits submitted from 2014 to early 2019. This assessment provides a general idea of how many future properties (a total of 333) may be constructed, or may have upgrades done, within dam inundation areas (see Table 5-54). More detail on the specific types of permits granted, particularly the kind of work class and case type for each permit group, can be found under the Asset Summary section of this plan.

Table 5-54 Building Permits Submitted in Dam Inundation Areas from 2014-2019

Work Class	Case Type	Work Class Type Total
Conditional Use Permit	Land Use	24
Minor Use Permit		106
New Structure	PMTC - Commercial Permit	43
	PMTR - Residential Permit	160
TOTAL		333

Source: San Luis Obispo County Planning & Building Department, Wood GIS analysis



Risk Summary

The overall significance of dam inundation in San Luis Obispo County is Medium.

- Based on historical evidence dam failures can happen and flood downstream communities in the county, though not frequently.
- *Effects on property:* Countywide there are 9,622 parcels at risk, worth \$2.67 million, with a loss estimate of \$1.33 million. The Unincorporated areas account for 35% of the total structures at risk, and about 32% of the total estimated losses. The Lopez dam puts the most parcels at risk of dam inundation, with 8,356 county-wide (most in Arroyo Grande), followed by the Salinas and Whale Rock dams. However, besides Arroyo Grande, the most parcels at risk of various high hazard dam failures are Grover Beach and the unincorporated areas of the county. Residential structures make up the most parcels at risk of flooding from dam failures (including multi-family residential, other residential parcels, and mobile/manufactured homed), followed by exempt/miscellaneous/government/utilities parcels and commercial parcels.
- *Effects on people:* People are vulnerable to dam failure in San Luis Obispo County. An estimated 21,287 people might be displaced from their homes based the location of their residences along the inundation areas.
- *Effects on critical facilities and infrastructure:* GIS analysis yielded that 33 critical facilities are found within the Lopez Dam's inundation area, with 1 additional falling in the Nacimiento Lake Dam inundation area (within the Heritage Ranch Community Services District) for a total of 34 critical facilities at risk of this hazard. A total of 13 of those in Arroyo Grande, 13 in the unincorporated areas of the county, and 8 facilities in Grover Beach.
- *Effects on economy:* Dam inundation can disrupt transportation corridors, affecting the economy by impeding or reducing flows of goods, people, and resources.
- *Related Hazards:* adverse weather, flooding, earthquake/liquefaction, tsunami/seiches, land subsidence, landslide, drought.

Table 5-55 Dam Inundation Risk Summary by Jurisdiction

Jurisdiction	Geographic Area	Probability of Future Occurrence	Magnitude/Severity (Extent)	Overall Significance
San Luis Obispo County	Limited	Occasional	Critical	Medium
City of Arroyo Grande	Extensive	Unlikely	Catastrophic	Medium
City of Atascadero	Limited	Unlikely	Limited	Low
City of Grover Beach	Extensive	Unlikely	Catastrophic	Medium
City of Morro Bay	Limited	Unlikely	Negligible	Low
City of Paso Robles	Significant	Occasional	Limited	Low
City of Pismo Beach	Limited	Occasional	Critical	Medium
City of San Luis Obispo	N/A			
Avila Beach CSD	Limited	Unlikely	Limited	Low
Ground Squirrel Hollow CSD	Limited	Unlikely	Limited	Low
Heritage Ranch CSD	Extensive	Likely	Catastrophic	High

Jurisdiction	Geographic Area	Probability of Future Occurrence	Magnitude/Severity (Extent)	Overall Significance
Los Osos CSD	N/A			
Nipomo CSD	Limited	Unlikely	Limited	Low
San Miguel CSD	Limited	Unlikely	Negligible	Medium
San Simeon CSD	N/A			
Templeton CSD	Significant	Occasional	Limited	Low
Cayucos Sanitary District	Limited	Unlikely	Limited	Low
Port San Luis Harbor District	Limited	Unlikely	Negligible	Low
San Luis Obispo FCWCD	Limited	Occasional	Critical	Medium
South San Luis Obispo Sanitary District	Extensive	Unlikely	Catastrophic	Medium



5.3.9 Drought and Water Shortage

Hazard/Problem Description

Drought is a gradual phenomenon. Although droughts are sometimes characterized as emergencies, they differ from typical emergency events. Most natural disasters, such as floods or forest fires, occur relatively rapidly and afford little time for preparing for disaster response. Droughts occur slowly, over a multi-year period, and it is often not obvious or easy to quantify when a drought begins and ends.

Drought is a complex issue involving many factors—it occurs when a normal amount of moisture is not available to satisfy an area’s usual water-consuming activities. Drought can often be defined regionally based on its effects:

- **Meteorological** drought is defined by a period of substantially diminished precipitation duration and/or intensity. The commonly used definition of meteorological drought is an interval of time, generally on the order of months or years, during which the actual moisture supply at a given place consistently falls below the climatically appropriate moisture supply.
- **Agricultural** drought occurs when there is inadequate soil moisture to meet the needs of a particular crop at a particular time. Agricultural drought usually occurs after or during meteorological drought, but before hydrological drought and can affect livestock and other dry-land agricultural operations.
- **Hydrological** drought refers to deficiencies in surface and subsurface water supplies. It is measured as stream flow, snow pack, and as lake, reservoir, and groundwater levels. There is usually a delay between lack of rain or snow and less measurable water in streams, lakes, and reservoirs. Therefore, hydrological measurements tend to lag behind other drought indicators.
- **Socio-economic** drought occurs when physical water shortages start to affect the health, well-being, and quality of life of the people, or when the drought starts to affect the supply and demand of an economic product.

The California Department of Water Resources (DWR) says the following about drought:

“One dry year does not normally constitute a drought in California. California’s extensive system of water supply infrastructure—its reservoirs, groundwater basins, and inter-regional conveyance facilities—mitigates the effect of short-term dry periods for most water users. Defining when a drought begins is a function of drought impacts to water users. Hydrologic conditions constituting a drought for water users in one location may not constitute a drought for water users elsewhere, or for water users having a different water supply. Individual water suppliers may use criteria such as rainfall/runoff, amount of water in storage, or expected supply from a water wholesaler to define their water supply conditions.”

The drought issue in California is further compounded by water-rights. Water is a commodity possessed under a variety of legal doctrines. The prioritization of water rights between farming and federally protected fish habitats in California is part of this issue.

Drought impacts are wide-reaching and may be economic, environmental, and/or societal. The most significant impacts associated with drought in the planning area are those related to water intensive activities such as agriculture, wildfire protection, municipal usage, commerce, tourism, recreation, and wildlife preservation. Also, during a drought, allocations go down, which results in reduced water availability. Voluntary water conservation measures are typically implemented during extended droughts. A reduction of electric power generation and water quality deterioration are also potential problems.

Drought conditions can also cause soil to compact and not absorb water well, potentially making an area more susceptible to flooding.

Geographic Area

Drought is a regional hazard, and at its worst can affect the entire state of California with varying levels of dryness and drought activity (as will be covered in more detail under the sections to follow). It is safe to assume that unless the drought event is at its very beginning or very end, if any area of the County of San Luis Obispo is affected by any level of drought, the other areas of the county are experiencing varying effects as well. The San Luis Obispo Integrated Regional Water Management Plan (2014) organized the County into sixteen Water Planning Areas, "intended to recognize important hydrogeologic units or water management areas throughout the County" (IRWM, 2014). As this plan was being written the County's Integrated Regional Water Management Plan was also in the process of being updated. The update to the IRWMP revised to the number of Water Planning Areas to six and aligned them with the USGS watershed boundary datasets, refer to Figure 5-48 below.

The major water supply for all of the Water Planning Areas (WPA) come from groundwater sources and minor supplies from surface water sources such as the Salinas and Estrella Rivers. During periods of drought there is an increased demand for groundwater resources. This being the case, in addition to groundwater sources most of the WPAs also receive water supplies from other sources such as, the State Water Project, Nacimiento Water Project and Reservoirs (Whale Rock, Chorro, Lopez Lake, Salina). Some communities have gone beyond groundwater and surface water supplies and have developed recycled water programs (City of San Luis Obispo and City of Pismo Beach) for the purposes of irrigating landscaping or control dust on construction sites. The City of Morro Bay has also implemented a desalination project. Drought impacts are an issue for all of the Water Planning Areas.

Sustainable Groundwater Management Act of 2014

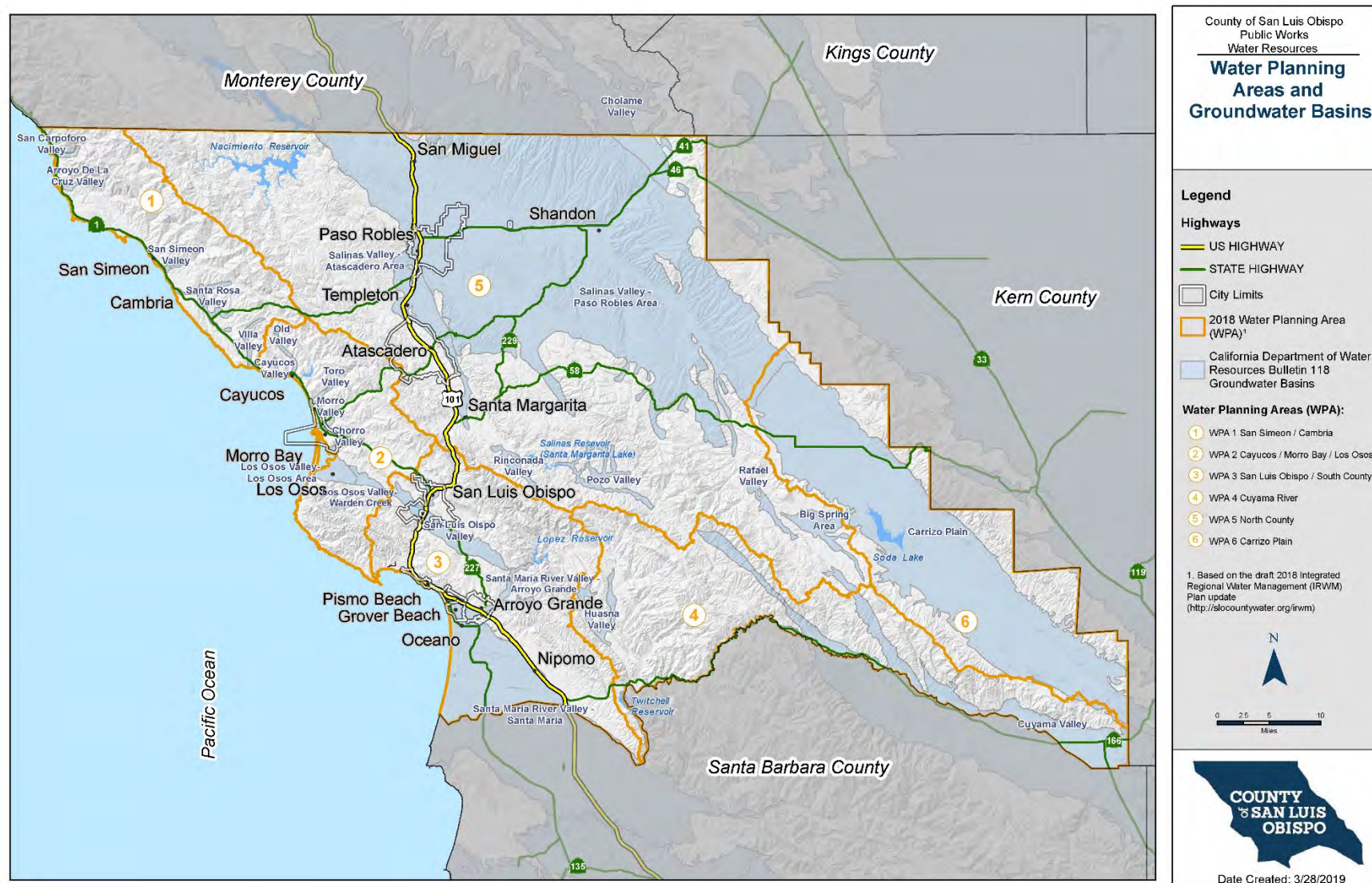
Then Central Coast region and all of California have been experiencing significant drought and water shortages since 2011. Only recently as of February 2019 did the County and the majority of the state come out of drought. In January 2014 the Governor declared an emergency proclamation due to multiple years of drought. The proclamation called on citizens to reduce water use by 20 percent; with a subsequent executive order in April 2015 that directed urban water agencies to reduce water use by 25 percent (Ken Topping, 2016). In September 2014, the Governor signed a three-bill package (California Senate Bills 1168 and 1319, and Assembly Bill 1739), known as the Sustainable Groundwater Management Act of 2014 (SGMA). The SGMA provides for the establishment of local Groundwater Sustainability Agencies (GSAs) to manage groundwater sustainability within the groundwater subbasins defined by the California Department of Water Resources (DWR).

The DWR prioritized all groundwater basins in the state designating High and Medium priority basins. High or medium priority basins are subject to critical conditions of overdraft are required to submit a Groundwater Sustainability Plan (GSP) by January 31, 2020. The purpose of the GSP to ensure a sustainable yield of groundwater, without causing undesirable results. The deadline to submit a GSP for high or medium priority basin not subject to critical conditions of overdraft is January 31, 2022. Failure to comply with that requirement could result in the State asserting its power to manage local groundwater resources. The State has identified the following five high and medium priority groundwater basins within San Luis Obispo County:

1. Paso Robles (Priority Pending)
2. Santa Maria (Priority Pending)
3. Los Osos (Priority Pending)
4. San Luis Obispo (Edna) Valley (High)
5. Cuyama Valley (High)
6. Atascadero (Very Low)



Figure 5-48 San Luis Obispo County Water Planning Areas



Source: San Luis Obispo Public Works, Water Resources Division

Extent (Magnitude/Severity)

The U.S. Drought Monitor is an accepted and widely used site for obtaining and summarizing drought information, as it integrates data from several other sources including the Palmer Drought Index, Soil Moisture Models, U.S. Geological Survey Weekly Stream Flows, Standardized Precipitation Index, and the Satellite Vegetation Health Index. It includes drought intensity categories for measuring dry conditions across counties, states, and regions of the U.S., so that drought can be quantified. These categories range from "abnormally dry" to "exceptional drought." The following figures provide "snapshots in time" of the drought conditions in California as of March 2019, February 2019, and August 2015 (during the period of the last multi-year drought in San Luis Obispo County and the state, from 2012- 2017). The snapshots selected are instrumental in depicting both the historic and potential change in drought's geographic range and severity in the County (circled in blue). Due to severe winter storms that brought heavy rains in February and March 2019, the County for the first time since 2011 is no longer experiencing dryness or drought (San Luis Obispo Tribune 2019).

Note: The Drought Monitor maps integrate data from several sources including the Palmer Drought Index, Soil Moisture Models, U.S. Geological Survey Weekly Stream flows, Standardized Precipitation Index, and Satellite Vegetation Health Index.

Figure 5-49 U.S. Drought Monitor for California: March 7, 2019

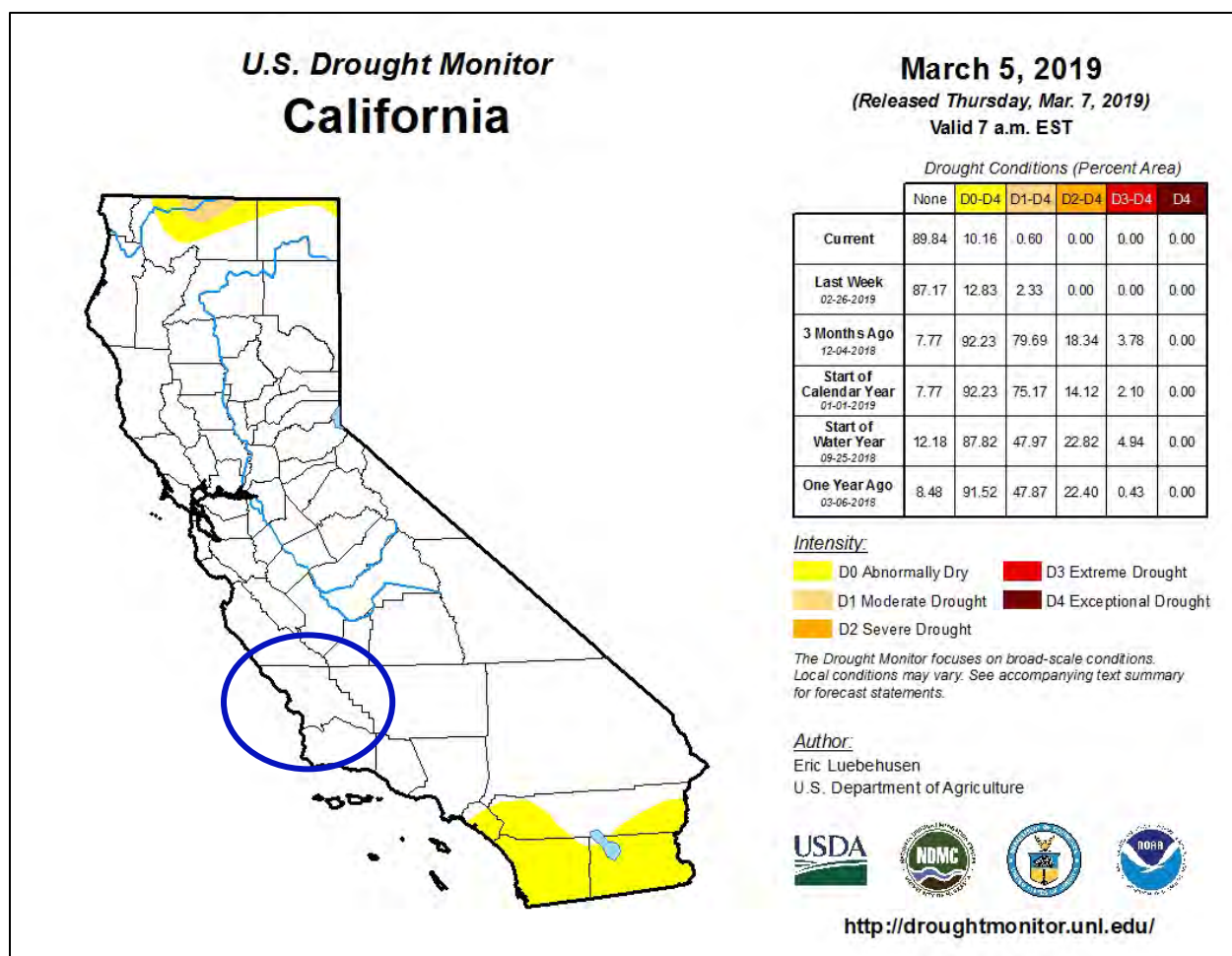


Figure 5-50 U.S. Drought Monitor for California: February 5, 2019

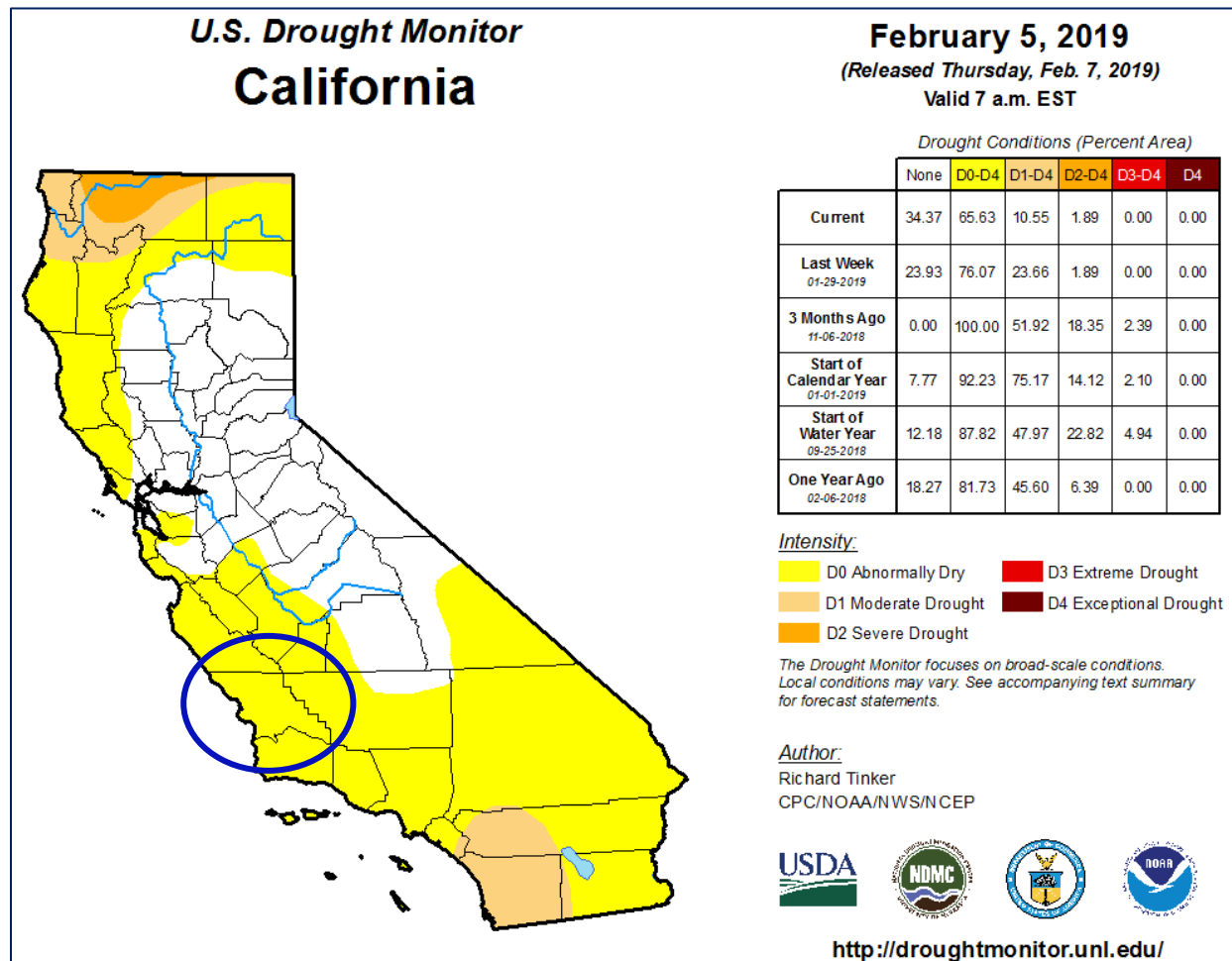
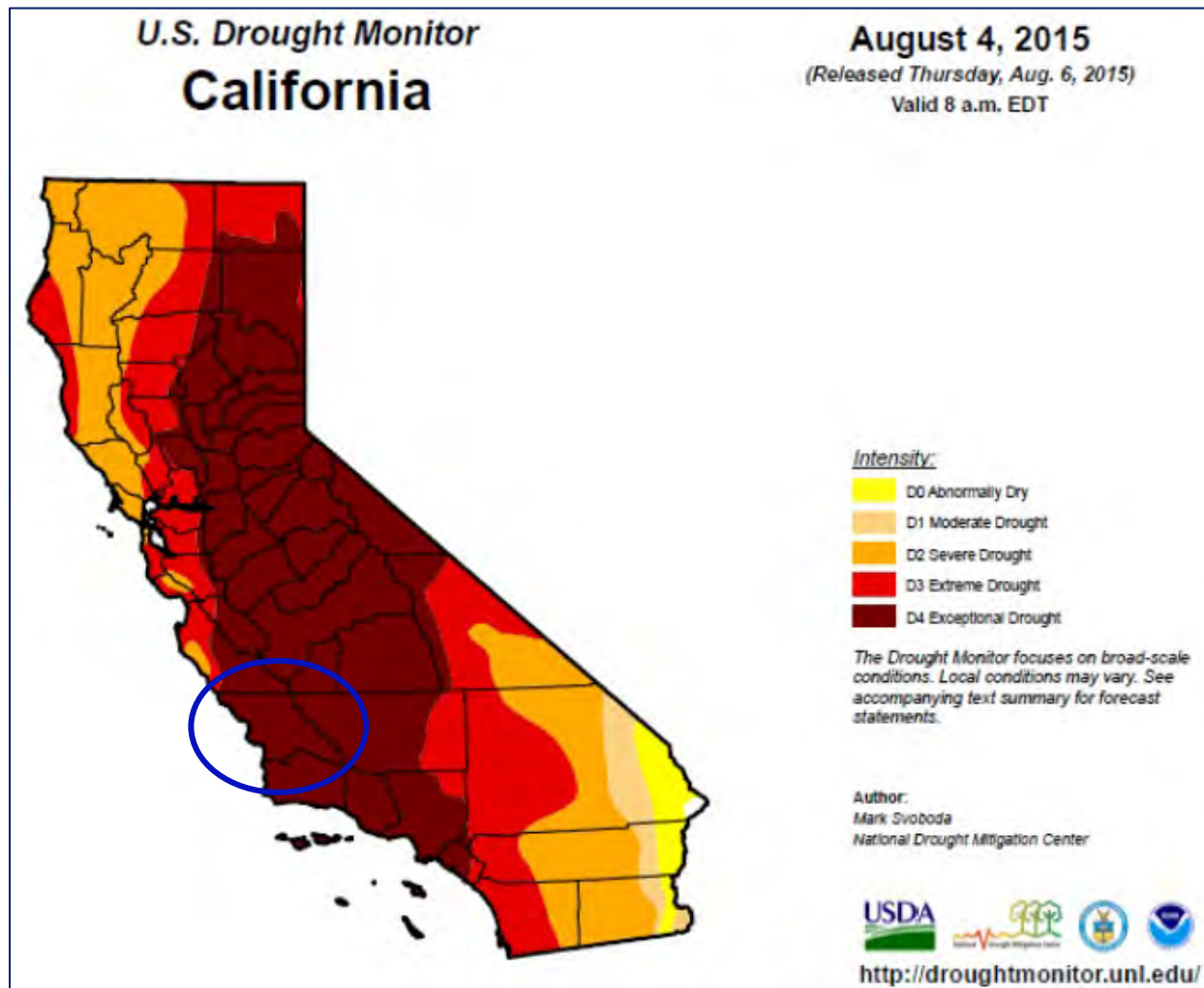


Figure 5-51 U.S. Drought Monitor for California: August 4, 2015



Past Occurrences

Historically, California has experienced multiple severe droughts. California's most recent multi-year drought occurred from 2012-2017 as previously mentioned, but the driest single year of California's measured hydrologic record was 1977.

The following multi-year droughts were identified as having significant impacts on the planning area:

- **1929 – 1934** – This statewide drought established the criteria commonly used in designing storage capacity and yield for large Northern California reservoirs, and is hence one of the first major historic droughts noted in California.
- **1975-1977** — From November 1975 through November 1977, California experienced one of its most severe droughts. Although people in many areas of the state are accustomed to very little precipitation during the growing season (April to October), they expect it in the winter. In 1976 and 1977, the winters brought only one-half and one-third of normal precipitation, respectively. Most surface storage reservoirs were substantially drained in 1976, leading to widespread water shortages when 1977 turned out to be even drier. Thirty-one counties were affected, resulting in \$2.67 billion in crop damage.

- **1987-1992** — San Luis Obispo County also suffered adverse effects resulting from this statewide drought, when low precipitation and runoff levels hit the Central Coast the hardest, adversely affecting about 30% of the state's population, much of the dry-farmed agriculture, and over 40 percent of the irrigated agriculture. Fish and wildfire suffered as well, as did the recreation and hydroelectric production sectors. Forestry losses and fires were very high.
- **2007 – 2009** – California proclaimed a statewide drought in 2009, and unprecedented restrictions were placed on water diversions to protect fish species, exacerbating drought impacts for water users. The greatest impacts of this multi-year drought were suffered on the western side of the San Joaquin Valley, on agricultural communities where drought effects were coupled with the economic recession. Emergency response actions were necessary with regards to social services.
- **2012 – 2017** – Drought produced severe impacts to water wells throughout the planning area, with a high number of wells running dry. Land subsidence due to increased groundwater pumping also occurred in areas of the San Joaquin Valley close to the Central Coast counties. Crop damage was widespread as well. Water allotments were drastically reduced in many towns and water agencies, with extremely high costs for procuring water. In addition, job loss occurred with many families requiring food supply assistance, and water supply assistance provided to home owners with dry wells. According to a report released by UC Davis Center for Watershed Sciences, the 2014 California drought cost the state's agriculture industry about \$1 billion in lost revenue, with a total statewide economic cost of the drought calculated to be \$2.2 billion. The 2014 drought, the report says, is responsible for the greatest water loss ever seen in California agriculture - about one third less than normal. The report calls the groundwater situation in California "a slow-moving train wreck." (Source: <https://statesummaries.ncics.org/ca>). On March 11, 2014 the San Luis Obispo County Board of Supervisors proclaimed a local emergency which lasted for three years until the Board adopted a resolution on May 23, 2017 to end the local emergency. As noted above, the Governor proclaimed a State of Emergency due to drought conditions and the related wide-ranging impacts. The Governor's proclaimed State of Emergency due to drought covered a similar period, from January 17, 2014 to April 7, 2017. For the County of San Luis Obispo there were 13 disaster declarations from 2012-2017, though total associated financial losses across the various economic sectors is not available for all these recent drought-related declarations.

The following table summarizes both state and federal proclamations related to drought affecting the County of San Luis Obispo.

Table 5-56 Summary of Secretarial and Governor Disaster Declarations for Drought in San Luis Obispo County

Hazard Type	Disaster #	Year	State Proclamation	Federal Declaration	Damage
Drought	-	1976	2/1976, 3/1976, 7/1976	Not declared	\$ 2,664,000,000
Drought	EM-3023	1977	--	1/20/1977	--
Drought - Fast Track	S3268	2012	2/21/2012-5/14/2012 (begin to end)	7/12/2012 (Sec. approval)	--
Drought	S3379	2012	1/1/2012	9/5/2012	--
Drought	S3452	2012	--	12/19/2012	--

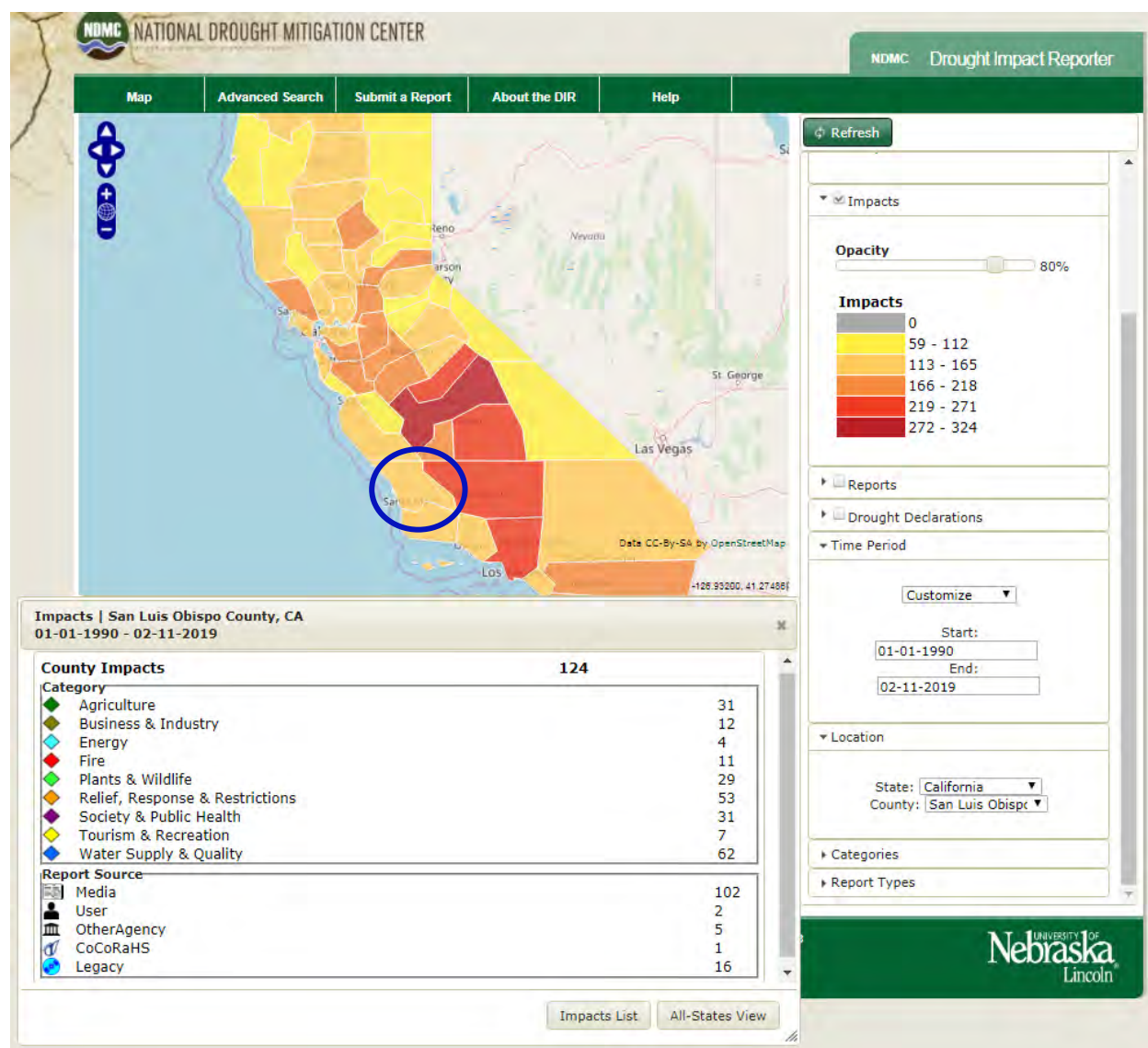


Hazard Type	Disaster #	Year	State Proclamation	Federal Declaration	Damage
Drought (FAST TRACK) Wind, Fire, Excessive heat, insects	S3491	2013	1/1/2013	2/27/2013	--
Drought (FAST TRACK) Wind, Fire, Excessive heat, insects	S3497	2013	1/15/2013	3/13/2013	--
Drought (FAST TRACK) Wind, Fire, Excessive heat, insects	S3504	2013	2/12/2013	4/10/2013	--
Drought (FAST TRACK) Wind, Fire, Excessive heat, insects	S3542	2013	4/23/2013	6/19/2013	--
Drought (FAST TRACK) Wind, Fire, Excessive heat, insects	S3626	2014	1/1/2014	1/15/2014	--
Drought	S3743	2014	1/1/2014	9/17/2014	--
Drought	Local Emergency	March 11, 2014- May 23, 2017	--	--	--
Drought (Fast Track) Excessive Heat; insects	S3784	2015	1/1/2015	2/4/2015	--
Drought	S3943	2015	1/2/2015	12/23/2015	--
Drought (FAST TRACK) Wind, Fire, Excessive heat, insects	S3952	2016	1/1/2016	2/17/2016	--
Drought - Fast Track	S4144	2017	1/1/2017	2/23/2017	--
Drought – Fast Track	S4467	2018-2019	10/1/2018	3/6/2019	--

Source: USDA Secretarial Disaster Declarations, 2019; FEMA Disaster Declarations, 2019, HMPC.

Figure 5-52 graphically displays the amount of drought-related reported impacts to San Luis Obispo County (United States Drought Impact Reporter 2019). While it is difficult to extract the specific impacts affecting the planning area, a total of 124 reports were submitted at the County level between January 1, 1990 and February 11, 2019. It is assumed that these drought related impacts for areas across the County are likely to have also affected the jurisdictions and communities at some point or to some extent. Based on the summary of negative effects to the county since 1990 the categories of water supply/quality as well as relief/response/restrictions have had the most reports, followed by the agriculture sector and society/public health. Other sectors such as “plants and wildlife” have also suffered the effects of drought but to smaller extents.

Figure 5-52 Drought Impact Reporter Summary of Impacts at the County Level in San Luis Obispo County, 1990-February 2019



Source: National Drought Mitigation Center - Drought Impact Reporter, 2019

Probability of Future of Drought Occurrences

Likely —Historical drought data for the County planning area and the Central Coast region indicate there have been five significant multi-year droughts in the last 90 years. This equates to a multi-year drought every 18 years on average, or a 5.5 percent chance of a drought in any given year. Based on this data, droughts will likely affect the planning area. Given the historical occurrence of severe drought impacts throughout San Luis Obispo County and across the state (summarized in the Past Occurrences section of this section), the HMPC understands that drought will continue to pose a high degree of risk to the entire planning area, potentially impacting crops, livestock, water resources, the natural environment at large, buildings and infrastructure (from cascading or compound hazards), and local economies.

In addition, although drought affects the entire planning equally, the potential impacts may be variable and specific to each jurisdiction, depending on contextual factors such as the degree of assets and activities historically impacted by drought within each jurisdiction, such as the agricultural and parks and tourism industries.

Climate Change Considerations

Scientific studies prepared for various California climate assessments and adaptations strategies show that drought conditions in California are likely to become more frequent and persistent over the next century due to climate change. Temperatures are warming, heat waves are more frequent, and precipitation has become increasingly variable (California Natural Resources Agency 2018). Water resources are also already experiencing the following stresses: population growth, poor water quality, groundwater overdraft, and aging water infrastructure.

According to California’s Climate Adaptation Strategy, also referred to as “Safeguarding California Plan: 2018 Update”, climate change is likely to significantly diminish California’s future water supply. As a result the state must change its water management, as climate change will create greater competition for limited water supplies (California Natural Resources Agency 2018a). The recent drought conditions over the past decade underscore the need to examine water supply and distribution management, conservation, and use policies. California and the Central Coast region have experienced a succession of dry spells and with warmer temperatures and periodic droughts that frequently contribute to water shortages in the region.

Climate change projections of extreme prolonged droughts will exacerbate the Central Coast’s existing water supply challenges (Fourth Climate Change Assessment, 2018). In an average year, approximately 40 percent of the state’s total water supply comes from groundwater, and during a dry year this increases to more than half of the state’s water supply, with groundwater acting as a critical buffer against the impacts of drought and climate change (California Natural Resources Agency 2018).

Table 5-57 Summary of Climate Change Impacts on Water Resources

Resource	Type of Impact	Description
Sea Level	Direct	Sea level is rising and will likely impact coastal areas
Soil Moisture	Direct	Prolonged dry seasons can lead to decreases in soil moisture; drier vegetation
Vegetation	Indirect	Longer and more intense fire season with increased extent of area burned
Stream Conditions	Direct	Increases in water temperature; potential effects on fish
Snowpack	Indirect	Increases in temperature will lead to decreases in snowpack
Runoff	Direct	Warmer temperatures are likely to lead to a shift in peak runoff from spring to winter and a likely decrease in summer baseflow
Hydropower	Indirect	Decreased summer flows resulting from earlier snowmelt and a shift in peak runoff could affect hydropower generation during summer months



Resource	Type of Impact	Description
Precipitation	Direct	Warmer winter temperatures will result in a greater percentage of precipitation falling as rain rather than as snow
Groundwater	Indirect	Reduction in snowpack and extended periods of drought are likely to increase dependency on groundwater

Source: <http://frap.fire.ca.gov/data/assessment2010/pdfs/3.1water.pdf> p. 140

Vulnerability to Drought (High)

The historical and potential impacts of drought on property include crop loss, injury and death of livestock and pets, and damage to infrastructure and other buildings resulting from the secondary or cascading drought impacts such as land subsidence, soil erosion, and flash flooding. As a related drought impact, tree mortality has resulted in potentially vulnerable critical infrastructure property as these trees become more susceptible to falling with time and could affect properties in the county. For the following vulnerability categories crop losses, potential health issues related to drought, tree mortality, and other such issues tied to secondary and cascading impacts will be discussed.

General Property

Based on the USDA's Risk Management Agency Crop Indemnity Reports, which were collected for the years 2015-2018, crop losses due to drought were reported in every year except 2017 across the county. Table 5-58 summarizes the agricultural losses experienced across the county communities. A total of \$870,473 was indemnified for 11,169 acres of affected crops covering 30 policies, just in the last few years (since the last County hazard mitigation plan from 2014).

Table 5-58 Risk Management Agency Crop Indemnity Reports, 2015-2018

Year	Crop	Month of Loss Name	Policies Indemnified	Net Determined Acres	Indemnity Amount	Loss Ratio
2015	Wheat	March	1	22	\$ 1,541	4.05%
		September	1	22	\$ 1,541	4.05%
	Walnuts	May	1	40	\$ 15,582	1.86%
		April	1	32	\$ 20,186	8.90%
		July	1	104	\$ 36,851	3.14%
	Grapes	October	1	14	\$ 63,113	17.57%
		September	1	12	\$ 37,250	13.81%
		May	1	12	\$ 29,745	10.23%
	Barley	April	1	331	\$ 5,672	6.48%
		February	1	691	\$ 17,188	1.69%
		March	1	84	\$ 2,816	1.41%
		September	1	84	\$ 2,816	1.41%
		January	3	4,561	\$ 323,541	2.23%
		January	2	715	\$ 47,569	2.11%
		December	1	671	\$ 16,682	1.69%



Year	Crop	Month of Loss Name	Policies Indemnified	Net Determined Acres	Indemnity Amount	Loss Ratio
		April	1	29	\$ 259	0.30%
2016	Walnuts	August	1	32	\$ 13,360	5.70%
		February	1	104	\$ 43,307	4.14%
	Grapes	June	1	8	\$ 4,933	2.45%
2018	Barley	November	3	2,513	\$ 146,165	2.16%
		January	1	389	\$ 9,424	4.58%
		January	4	698	\$ 30,932	2.04%
TOTAL			30	11,169	\$ 870,473	

Source: USDA RMA Crop Indemnity Reports, 2019

In addition to crop losses, tree mortality hazards from drought, which compose just over 13% of the county in area, are found to intersect with a total of 39,540 properties across the county, based on the property centroids defined for all the hazards' parcel analyses. Refer to the Adverse Weather: High Wind and Tornados section for a summary of the analysis.

People

According to this California Department of Finance (DOF) the 2018 County population was 280,118 people. The County's population is projected to continue to increase by 0.4 percent annually through 2023 (Caltrans 2018). This projected population growth would add additional strain to the surface and already depleted groundwater supplies.

The historical and potential impacts of drought on populations include agricultural sector job loss, secondary economic losses to local businesses and public recreational resources, increased cost to local and state government for large-scale water acquisition and delivery, and water rationing and water wells running dry for individuals and families. As drought is often accompanied by prolonged periods of extreme heat, negative health impacts such as dehydration can also occur, where children and elderly are most susceptible. Air quality often declines in times of drought which can affect those with respiratory ailments.

Social Vulnerability

The areas of the county with the highest overall social vulnerability, based on the SoVI data presented and discussed in subsection 4.4.1, such as the City of Paso Robles and the City of San Luis Obispo are also located within groundwater basins identified by the State Department of Water Resources as potential priority basins due the depletion of groundwater resources. Both the City of Paso Robles and the City of San Luis Obispo have formed Groundwater Sustainability Agencies (GSA) to develop and implement of groundwater sustainability plans (GSP) to ensure sustainable management of the groundwater resources within their basin for current and future populations.

Critical Facilities

Drought impacts to critical facilities include water shortfalls for facility operations and critical functions, and potential structural destabilization and damage resulting from land subsidence. Refer to the section on Subsidence for more information.

Economy

Drought impacts to the local or regional economy can be difficult to quantify but can be extensive and long-lasting depending on the circumstances during, and after a severe drought event. If water resources are limited, effects would be more severe for industries that rely on large amounts of water and any prolonged drought would intensify these impacts. Sectors critical to the economy such as commerce, distribution, agriculture, tourism, related environmental resources, municipal and industrial water supply, key city assets, energy generation, and even socioeconomic aspects can be affected due to lack of, or even reduced quality of water resources.

Drought directly impacts rangeland for livestock in the County as was witnessed during the 2014 drought which had a significant impact on the ranching and agriculture economy. Between 2010 and 2014, roughly 75 percent of the cattle in San Luis Obispo County were sold or taken out of state to escape the drought conditions the County had been experiencing (LA Times 2015). The heavy reliance upon groundwater to irrigate rangeland for livestock makes this sector of the local economy especially vulnerable to future drought events.

Historic, Cultural, and Natural Resources

The historical and potential impacts of drought on the natural environment are widespread throughout public and private lands within the County, including tree mortality, impacts to all flora and fauna, and destabilization (erosion, subsidence) of land along streams and rivers, and within watersheds.

One of the core issues shaping the impact of drought in San Luis Obispo County and throughout California is water supply and demand. Several factors play into the issue including groundwater basins, surface water run-off, public and agricultural demand, and surface water storage watersheds. As such, an analysis was conducted through the 2010 Forest and Rangeland Assessment to identify threats and assets in order to select Priority Landscapes (PL) where water supply would benefit from forest management designed to protect or enhance water resources, the key effort which, in part, both defines and mitigates the severity of drought risk and vulnerabilities.

Given that the extent of the drought hazard is, in part, determined by the extent of groundwater over-pumping in San Luis Obispo County, it should also be pointed out that such over-pumping is part of a broader context of water supply and demand trends with related impacts to agriculture and the secondary hazard impacts from land subsidence resulting from groundwater withdrawal. The Paso Robles Groundwater Basin has experienced serious declines over the years due to groundwater pumping with the largest water use sector being agricultural uses (Paso Robles GSA, 2018). Refer to the Subsidence section for more information on the impacts on groundwater withdrawal.

Tree mortality was identified as an additional drought impact of significance to the County during the 2019 update. Tree mortality is a cascading impact which also affects (or worsens) other hazards such as wildfire, agricultural and biological hazards, and wind. In addition, drought-impacted trees become susceptible to diseases and insect infestations (bark beetle) further adding to the risk of tree mortality and related potential impacts. A die of blue oak trees which are considered some of the most drought-tolerant trees caused alarm throughout the County during the multiyear drought from 2012-2015. Researchers stated the reasoning behind the oak tree mortality was due to the roots of the trees were no longer able to reach the aquifers due to severe groundwater depletion (Weiser 2017).

The location, extent, and probability of occurrence for tree mortality can be viewed as sub-set to the drought hazard (though tree mortality issues are also discussed under other hazards sections such as Agricultural Pest Infestation and Plant Disease; Wildfires; Adverse Weather/Wind). Those areas of the natural environment susceptible to drought comprise a larger area, since tree mortality is related to other sub-factors specific to the species impacted such as tree age and soil composition. Refer to the Adverse Weather: High Wind and Tornado section for analysis on tree mortality in the county.

Future Development

With the County's population projected to continue to grow while climate change projections are showing an increased duration an intensity of drought events for the Central Coast region, it will be important for each new development application to be reviewed with existing and future water supplies in mind.

Because future development encompasses all forms of property, buildings, infrastructure, critical facilities and all related populations and their functions, drought impacts to future development align with the historical and potential impacts to populations, property, natural environment, and critical facilities discussed (above).

Risk Summary

- Due to the widespread impacts it can have, drought is considered a High significance hazard.
- There have been five multi-year droughts in the past 90 years. Most recent drought lasted from 2012 to 2017 and resulted in a declared state of emergency.
- 15 Disaster Declarations due to drought have been made in the last 41 years.
- 124 reports of impacts related to drought were made within San Luis Obispo between, 1990 and February 11, 2019.
- Between 2015-2018 a total of \$870,473 crop indemnity claims was paid due to crop losses for a total of 11,169 acres due to drought impacts.
- Significant impacts associated with past multiyear droughts have included 75% of livestock to be sold or moved out of state (2012-2015); Oak trees thought to be drought resilient were no longer able to reach aquifers and began to die off.
- Climate change projections show that extreme prolonged drought is likely to continue and will exacerbate existing water supply challenges.
- *Related Hazards:* Extreme Heat, Wildfire, Subsidence, Agricultural Pest Infestation and Disease

Table 5-59 Drought and Water Shortage Hazard Risk Summary

Jurisdiction	Geographic Area	Probability of Future Occurrence	Magnitude/Severity (Extent)	Overall Significance
San Luis Obispo County	Extensive	Likely	Critical	High
City of Arroyo Grande	Significant	Likely	Limited	Medium
City of Atascadero	Extensive	Likely	Limited	Medium
City of Grover Beach	Extensive	Likely	Limited	High
City of Morro Bay	Limited	Occasional	Negligible	Low
City of Paso Robles	Extensive	Likely	Limited	High
City of Pismo Beach	Extensive	Likely	Negligible	Medium

Jurisdiction	Geographic Area	Probability of Future Occurrence	Magnitude/Severity (Extent)	Overall Significance
City of San Luis Obispo	Extensive	Likely	Limited	Medium
Avila Beach CSD	Extensive	Likely	Critical	High
Ground Squirrel Hollow CSD	Limited	Occasional	Negligible	Low
Heritage Ranch CSD	Extensive	Highly Likely	Critical	High
Los Osos CSD	Significant	Likely	Limited	Medium
Nipomo CSD	Significant	Likely	Limited	High
San Miguel CSD	Extensive	Likely	Catastrophic	High
San Simeon CSD	Significant	Likely	Limited	Medium
Templeton CSD	Extensive	Likely	Limited	High
Cayucos Sanitary District	Limited	Occasional	Negligible	Low
Port San Luis Harbor District	Extensive	Likely	Limited	Low
San Luis Obispo FCWCD	Extensive	Likely	Critical	High
South San Luis Obispo Sanitary District	Significant	Likely	Limited	Low



5.3.10 Earthquakes, Faults, and Liquefaction

Hazard/Problem Definition

An **earthquake** is a sudden, rapid shaking of the ground caused by the breaking and shifting of rock beneath the earth's surface or along fault lines. For hundreds of millions of years, the forces of plate tectonics have shaped the Earth as the huge plates that form the Earth's surface move slowly over, under, and past each other. Sometimes the movement is gradual. At other times, the plates are locked together, unable to release the accumulating energy. When the accumulated energy grows strong enough, the plates break free causing the ground to shake. Most earthquakes occur at the boundaries where the plates meet, commonly called faults; however, some earthquakes occur in the middle of plates.

A **fault** is a fracture in the earth's crust along which movement has occurred either suddenly during earthquakes or slowly during a process called creep. Cumulative displacement may be tens or even hundreds of miles if movement occurs over geologic time. However, individual episodes are generally small, usually less than several feet, and are commonly separated by tens, hundreds, or thousands of years. Damage associated with fault-related ground rupture is normally confined to a fairly narrow band along the trend of the fault. Structures are often not able to withstand fault rupture and utilities crossing faults are at risk of damage. Fault displacement involves forces so great that it is generally not feasible (structurally or economically) to design and build structures to accommodate this rapid displacement.

Fault displacement can also occur in the form of barely perceptible movement called "fault creep." Damage by fault creep is usually expressed by the rupture or bending of buildings, fences, railroads, streets, pipelines, curbs, and other linear features. Excellent examples of fault creep can be seen in the Carrizo Plain area of eastern San Luis Obispo County where gradual creep on the San Andreas fault has offset stream beds, roadways, and fence lines. In addition, there is also the potential for co-seismic creep, where movement on a fault is triggered by an earthquake on another nearby fault.

Liquefaction occurs when ground shaking causes the mechanical properties of some fine grained, saturated soils to *liquefy* and act as a fluid (liquefaction). It is the result of a sudden loss of soil strength due to a rapid increase in soil pore water pressures caused by ground shaking. In order for liquefaction to occur, three general geotechnical characteristics should be present: 1) ground water should be present within the potentially liquefiable zone, 2) the potentially liquefiable zone should be granular and meet a specific range in grain-size distribution, and 3) the potentially liquefiable zone should be of low relative density. If those criteria are present and strong ground motion occurs, then those soils could liquefy, depending upon the intensity and duration of the strong ground motion. Liquefaction that produces surface effects generally occurs in the upper 40 to 50 feet of the soil column, although the phenomenon can occur deeper than 100 feet. The duration of ground shaking is also an important factor in causing liquefaction to occur. The larger the earthquake magnitude, and the longer the duration of strong ground shaking, the greater the potential there is for liquefaction to occur.

Geographic Area

USGS Quaternary earthquake fault zones were mapped to display the location of fault lines in and near the planning area, along with active and potentially active earthquake faults as determined at the local level. Figure 5-53 below displays these fault lines. Figure 5-54 is a zoomed in version of the faults underneath the county as well as offshore the coastal areas of the county. The county is overall covered by various fault lines and zones, running in a north-south fashion from the coast to the eastern slopes. All

active and potentially active faults are located to the east and south of the county, on or near the San Andreas Fault Zone, San Juan Fault Zone, Morales Fault, and La Panza Fault Zones. The Rinconada and East Huasna Fault Zones run towards the middle of the county, north-south, with the South Cuyama Fault Zone entering Santa Barbara county to the south of the planning area. The southwest and coastal areas of the county include several faults as well including the West Huasna, San Luis Range, Edna, Cambria, and Oceanic Fault Zones.



Figure 5-53 Earthquake Fault Lines and Zones in the Planning Area

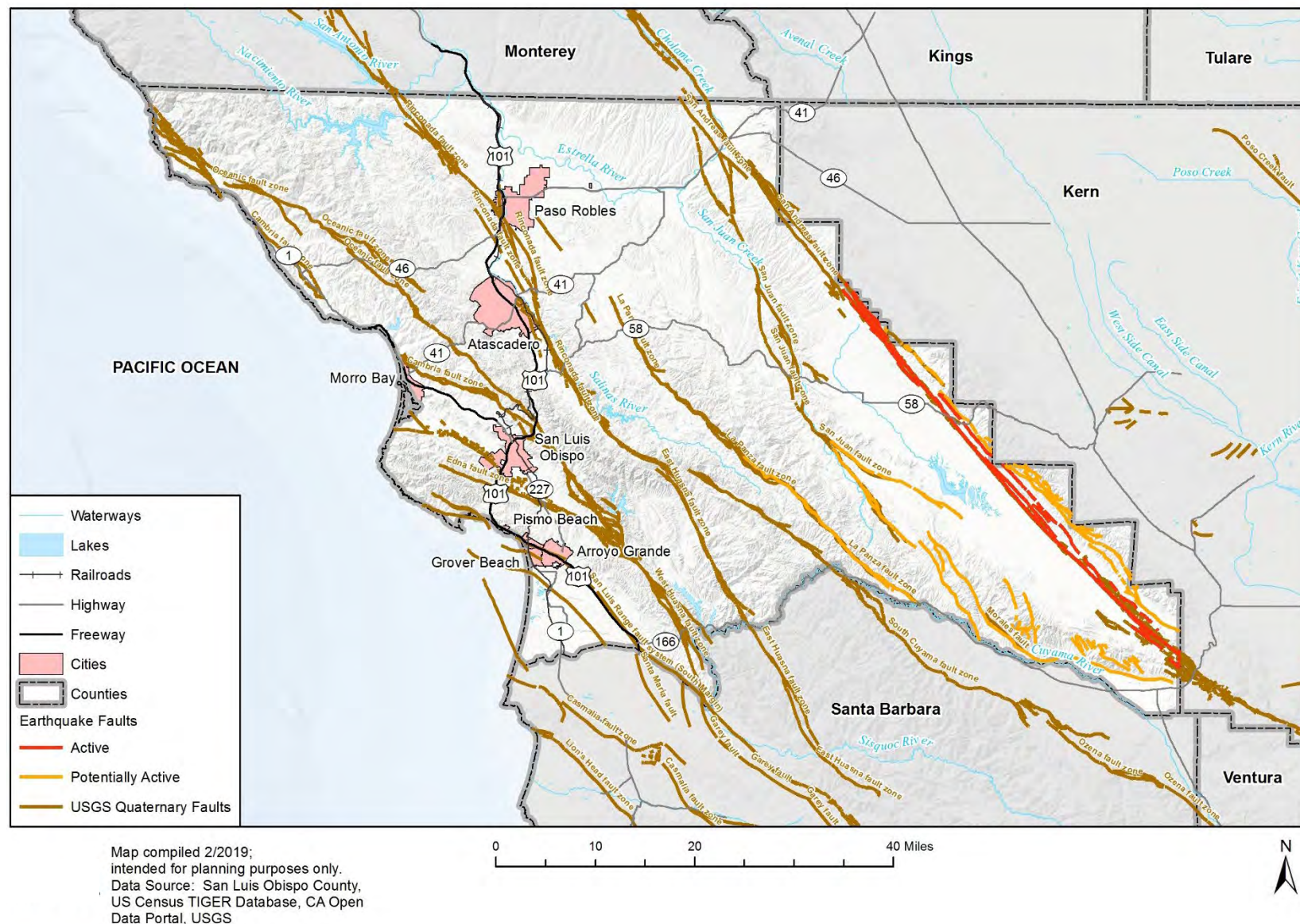
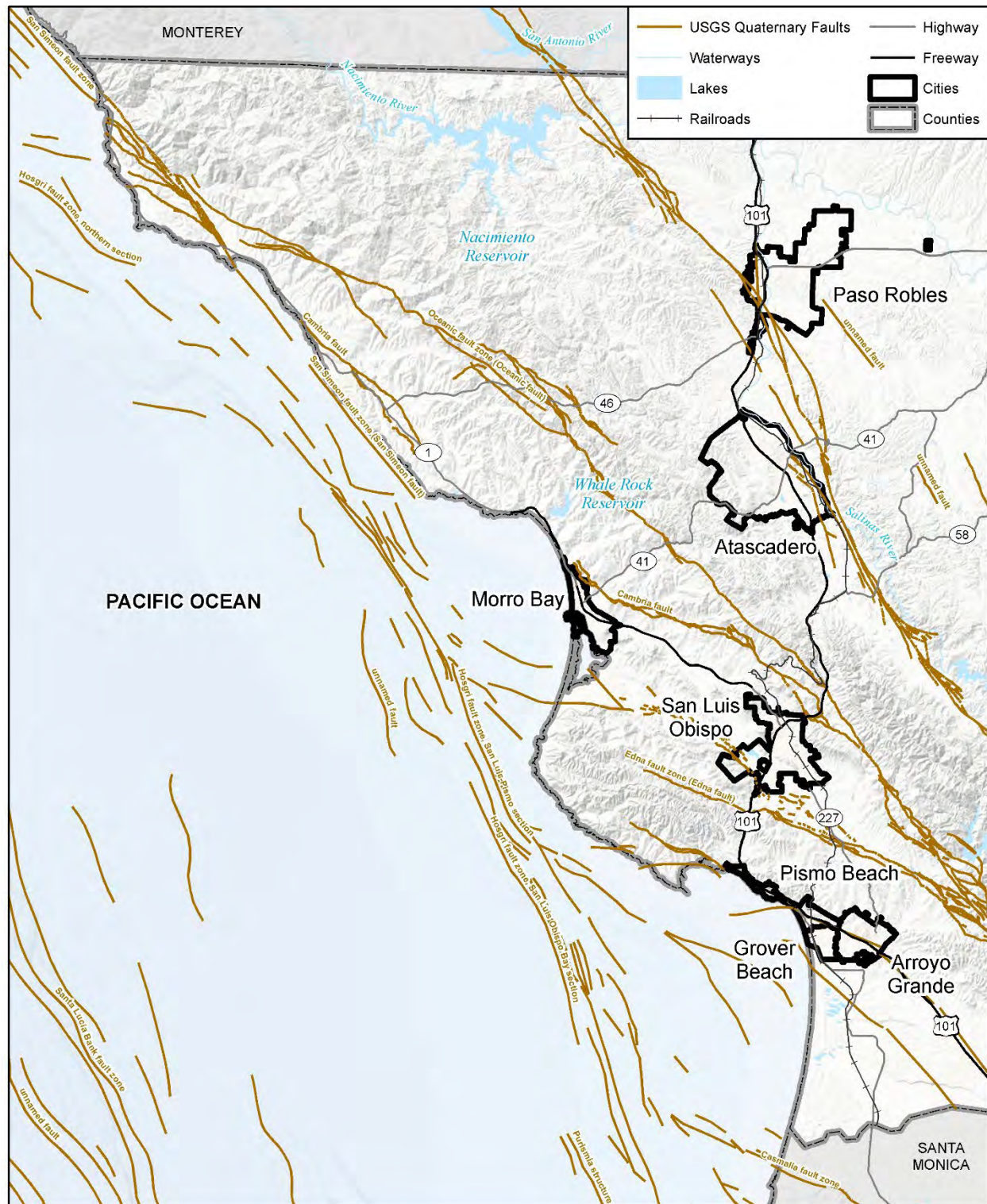


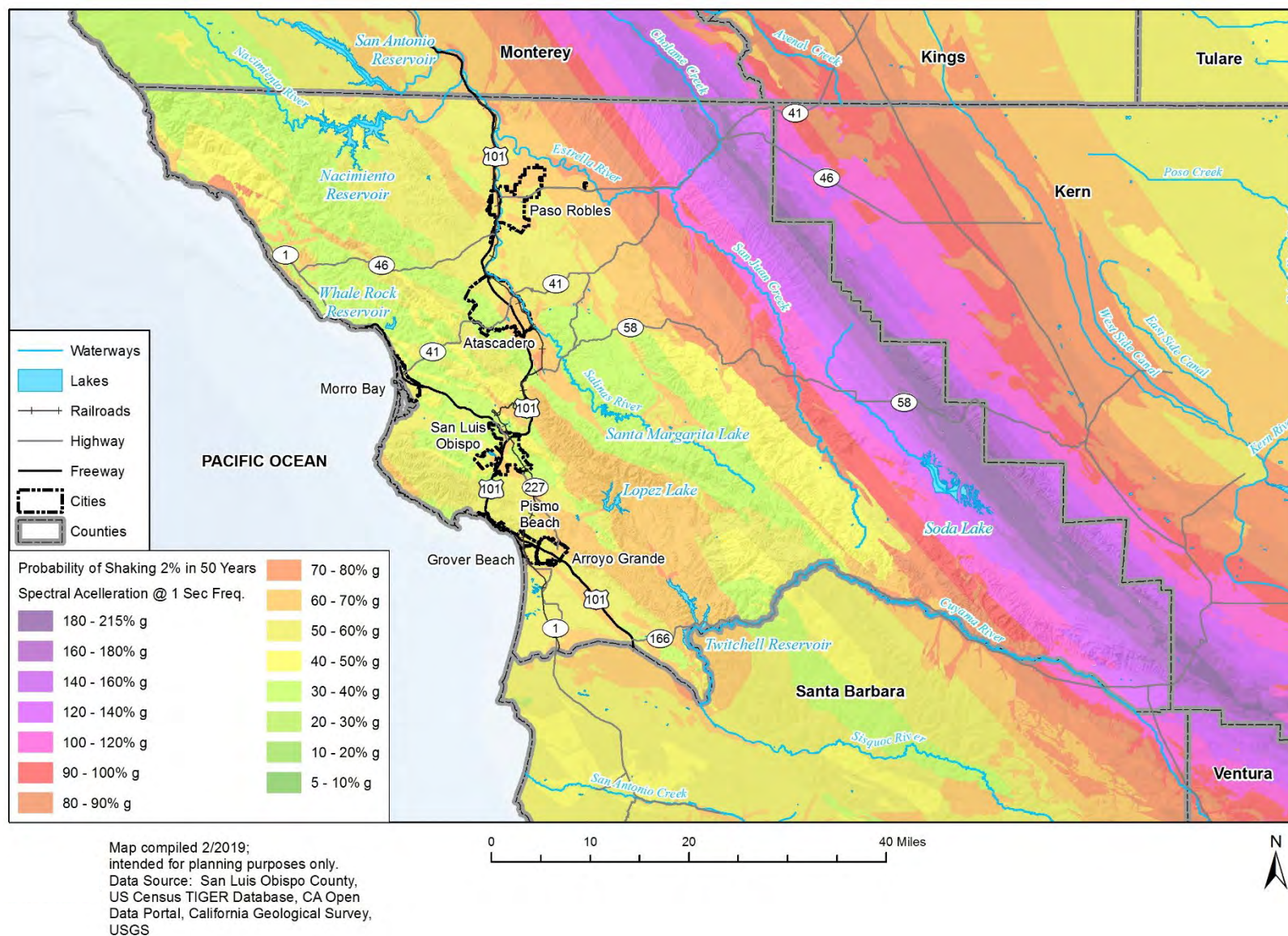
Figure 5-54 Offshore Earthquake Fault Lines and Zones in the Planning Area



Map compiled 5/2019;
intended for planning purposes only.
Data Source: San Luis Obispo County,
US Census TIGER Database, CA Open
Data Portal, USGS, LAFCO

Figure 5-55 is an earthquake shaking map of the county that is based on the 2% probability of occurrence in 50 years, based on analyses of these faults, soils, topography, groundwater, and the potential for earthquake shaking sufficiently strong to trigger landslide and liquefaction. It represents worst-case ground shaking and supports the conclusion that the San Luis Obispo County planning area is at risk to future damaging earthquake hazards, especially in the eastern portion of the County near the San Andreas Fault. The western portion of San Luis Obispo County could experience ground accelerations in the range of 0.3 g (30% g) to 0.4 g (40% g) in the next 50 years. The eastern portion of the County adjacent to the San Andreas Fault could experience ground accelerations of 0.5 g (50% g) to 0.7 g (70% g) in the next 50 years. The statistical variance in estimated ground acceleration could easily be plus or minus 50 percent of the estimated ground motion.

Figure 5-55 Ground Shaking Potential from Spectral Acceleration the Planning Area – Probability of Shaking 2% in 50 Years



Description of the Major Faults in San Luis Obispo County

The California Geological Survey (CGS) is charged with recording and mapping faults throughout California. The Alquist-Priolo Earthquake Fault Zoning (AP) Act was passed into law following the destructive February 9, 1971 6.6 San Fernando earthquake. The AP Act provides a mechanism for reducing losses from surface fault rupture on a statewide basis. The intent of the AP Act is to insure public safety by prohibiting the siting of most structures for human occupancy on or near active faults that constitute a potential hazard to structures from surface faulting or fault creep. Fault zoning is continually updated and reviewed by CGS and it is likely that other faults in addition to those currently listed by CGS will be added to the list in the future. The primary active faults identified by the AP Act in the County include the San Andreas, San Simeon-Hosgri, and Los Osos faults. A map of these earthquake fault zones within the County is available below.

Figure 5-56 Earthquake Fault Zone Designations in San Luis Obispo County

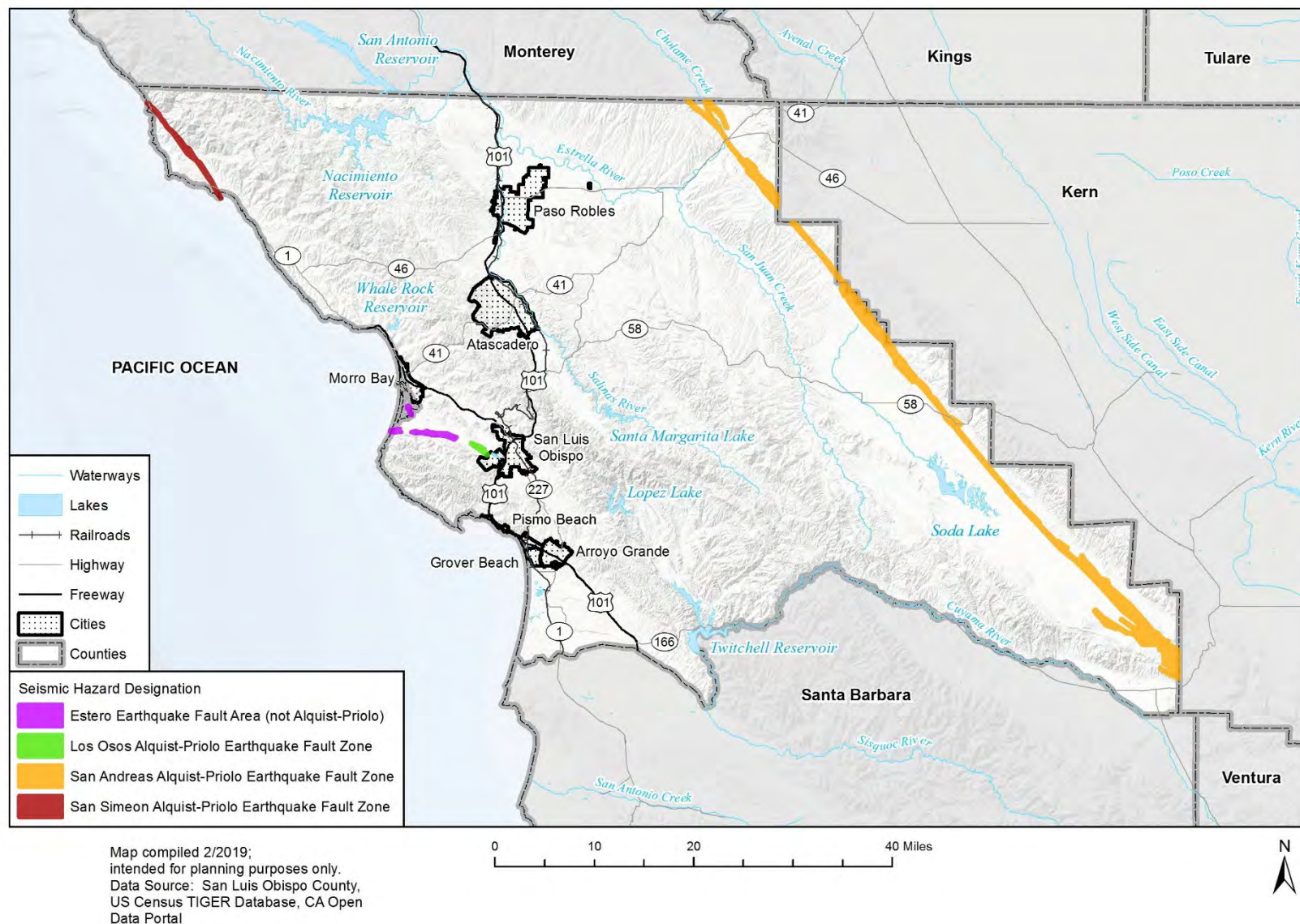


Table 5-60 lists the major faults that have been mapped by the CGS in San Luis Obispo County (some of which were briefly introduced in this section and mapped under Figure 5-53). The potential for fault rupture hazards along other faults listed in the table as inactive faults is generally considered to be low. However, given the few active or potentially active faults in the planning area, earthquake hazards should be considered when placing a structure near or over any suspected fault location.

Table 5-60 Major Faults in San Luis Obispo County

Fault Name	Maximum Moment Magnitude	Activity	Earthquake Hazard Zone
Cambria	6.25	Potentially Active	Yes
Casmalia	6.5	Potentially Active	No
East Huasna	unknown	Potentially active	No
San Simeon-Hosgri	7.3	Active	Yes
La Panza Fault	7.5	Potentially Active	No
Los Osos	6.8	Active	Yes
Nacimiento	unknown	Active	No
Rinconada	7.3	Potentially Active	No
San Andreas (1857 rupture)	7.8	Active	Yes
San Andreas (1906)	7.9	Active	Yes
San Andreas-Carrizo	7.2	Active	Yes
San Andreas-Cholame	6.9	Active	Yes
San Andreas-Parkfield Segment	6.7	Active	Yes
San Juan	7.0	Potentially Active	No
San Luis Range	7.0	Potentially Active	No
Shoreline	6.5	Under Study	Under Study

Source: SLO HMP 2014

Cambria Fault: The northwesterly trending Cambria fault is approximately 64 kilometers (37.77 miles) long, including an 8-kilometer (5 mile) projection across Estero Bay. The fault is shown to coming back onshore near Morro Bay, and converging with the Oceanic and West Huasna fault near San Luis Obispo. The Cambria fault is considered potentially active. The Safety Element of the San Luis Obispo County General Plan lists the maximum moment magnitude as 6.25 for the Cambria.

East Huasna Fault: The East Husana fault zone trends north-northwest for a distance of about 70 kilometers (43.5 miles) from near Sisquoc in Santa Barbara County northward until it intersects with the South Cuyuma fault about 20 kilometers (12.4 miles) east of the city of San Luis Obispo. The fault is considered potentially active.

La Panza Fault: The northwest trending La Panza fault has been mapped for 71 kilometers (44 miles) along the western base of the La Panza Range. The La Panza fault has been identified as a thrust or reverse fault. The La Panza fault is considered potentially active. The Safety Element of the San Luis Obispo County General Plan lists the maximum moment magnitude as 5.0 - 7.5 for the La Panza.

Los Osos and Edna Fault Zones: The Los Osos fault zone has been mapped generally in an east/west orientation, along the northern flank of the Irish Hills. The western end of the onshore fault zone is located near the community of Los Osos, and the eastern end located near U.S. Highway 101. To the east of U.S. Highway 101, the fault may continue along the northeast flank of the Irish Hills as the Edna fault

zone. Assuming an overall length of 56 kilometers (35 miles), the Los Osos fault has the potential to generate an earthquake with about a magnitude 6.75. Also near this area are the Hosgri and Shoreline faults.

Nacimiento Fault Zone: The Nacimiento fault zone has been mapped as a regional fault by many investigators, however it is not included as part of the data base of California faults by the California Geological Survey (CSG). While the fault is considered inactive, the Bryson earthquake of 1952 is sometimes assigned to the Nacimiento fault zone, which would make the fault seismically active. The Bryson earthquake, which occurred in a rural area of northern San Luis Obispo County, is poorly understood and may be attributed to movement on other faults such as the active San Simeon or potentially active Rinconada fault zones. The faults that make up the Nacimiento fault zone enter the County in the vicinity of Nacimiento Lake. Faults, or portions of the faults, related to this system trend southwest near the city of Paso Robles, parallel Highway 101, pass through or near Templeton, through or near the city of Atascadero, through the area in and near Santa Margarita, and continues south. Given the fault's proximity to major population centers, structures, dams, transportation and pipeline routes, it could pose a serious threat to the County.

Rinconada Fault Zone: The Rinconada fault zone has been mapped as a regional fault zone about 189 kilometers (117 miles) long located along the western margin of the La Panza Range. The Rinconada fault is inferred to be part of a zone of faults including the Jolon, San Marcos, Espinosa, and Reliz faults that extends from Monterey Bay southward to its juncture with the Nacimiento fault. The California Geologic Survey considers the Rinconada fault to be potentially active. The county's Safety Element lists the maximum moment magnitude as 7.3 for the Rinconada.

San Andreas Fault: The San Andreas is a historically active fault thought to be capable of an earthquake up to and above the 8.0 magnitude range and generally runs along the eastern county border. It enters the County near the Cholame area, passes through the Carrizo Plain, and exits the county near Maricopa. As it passes through the County, three relatively distinct portions of the fault have separate potentials for causing a damaging earthquake. The portion of the fault that runs from Monterey County into San Luis Obispo County to an area near Cholame has commonly been known as the Parkfield segment of the San Andreas fault system. That portion of the fault system is the one that has an approximate 5.6 – 6.0 magnitude earthquake from time to time. A segment of the system that runs from approximately the Cholame area to about the northern edge of the Carrizo Plain area has been commonly known as the Cholame segment. The portion running from the northern Carrizo Plain area and out of the County into Kern County has been commonly known as the Carrizo segment.

It is believed that in 1857 a large (possible 7.8 or larger) earthquake occurred on the San Andreas fault that possibly originated in the Parkfield area and stretched along the fault to the area near San Bernardino. This is perhaps an illustration of the potential for the San Andreas to cause a very powerful earthquake and the need to be prepared.

A major earthquake along any section of the San Andreas Fault could result in serious damage within San Luis Obispo County. An earthquake of 8.0 or greater magnitude would result in severe ground motion and could cause damage throughout the County.

Small earthquakes do occur in the area of the San Andreas within the County from time to time, perhaps most frequently in the Parkfield and nearby areas. Generally, they are so small or in such isolated areas that they are not felt or are felt only very close by.

San Simeon - Hosgri Fault Zone: The San Simeon-Hosgri fault system generally consists of two fault zones: the Hosgri fault zone represented by a series of faults that are mapped off the San Luis Obispo County coast; and the San Simeon fault zone, which appears to be associated with the -Hosgri, and comes onshore near the pier at San Simeon point. The San Simeon fault is considered to be active. The Hosgri fault zone has been interpreted to extend from the northern termination west of the southern San Simeon fault in the Cambria/Point Estero area to its southern termination offshore of Point Perdernes, which is south of the Santa Maria River, off of Santa Barbara County. The Safety Element of the San Luis Obispo County General Plan lists the maximum moment magnitude as 7.3 for the Hosgri-San Simeon.

Shoreline Fault: In 2008, the Shoreline Fault was discovered off the coast in the area of the Diablo Canyon Power Plant which is owned and operated by Pacific Gas and Electric Company (PG&E). The initial study of the fault, using conservative assumptions about the total length of the fault zone, indicates that a potential magnitude 6.5 strike-slip earthquake is possible. Follow up investigations were performed by PG&E in 2009 and 2010 and more detailed studies are planned in order to refine the size and potential of the fault. (Report on the Analysis of the Shoreline Fault Zone, Central Coastal California, Report to the U.S. Nuclear Regulatory Commission, January 2011, PG&E). To address public concerns regarding the seismicity of the area surrounding Diablo Canyon, PG&E is proceeding with additional fault studies, which have and do include research along the Los Osos Valley and in the Irish Hills. The company will share the results with local jurisdictions in order to enhance their knowledge of the seismic characteristics of the region for their emergency planning and building standards requirements. Outside the scope of this plan, the County, other local agencies, and state agencies maintain emergency planning procedures related to Diablo Canyon that are regulated by FEMA and the Nuclear Regulatory Commission.

Fault Rupture Hazard Potential by Area

The following paragraphs briefly discuss the fault rupture hazard potential for the cities and several of the highly populated unincorporated areas of the County including Cambria, Cayucos, Nipomo, Oceano, the South Bay area, San Miguel, Santa Margarita, and Templeton. Note this section is intended to generally describe fault rupture hazard by area; however, it does not mean significant damages may not occur in other areas.

Arroyo Grande: Mapped faults in the City of Arroyo Grande are the potentially active Wilmar Avenue fault and the inactive Pismo fault. The Wilmar Avenue fault is exposed in the sea cliff near Pismo Beach and the buried trace of the fault is inferred to strike northwest-southeast parallel and adjacent to U.S. Highway 101 beneath portions of Arroyo Grande. The potentially active fault presents a moderate potential fault rupture hazard to the City. Further studies to evaluate the activity of the faults are warranted, prior to placing structures near the mapped fault traces.

Atascadero: Mapped faults in the vicinity of Atascadero are the potentially active Rinconada fault and the Nacimiento fault zones. The Rinconada fault and its western associated fault, the Jolon, is mapped trending northwest along the eastern City limits. The fault mostly lies east of the Salinas River and outside the City limits. Although there is evidence that indicates movement along the Rinconada fault, the fault lacks any geomorphic features to suggest the fault is active. Because the Rinconada fault is potentially

active, it presents a moderate fault rupture hazard to the City of Atascadero. Further studies to evaluate the activity of the faults are warranted, prior to placing structures near the mapped fault traces.

The Nacimiento fault zone consists of a nearly 10-kilometer wide northwest trending, complex fault zone located in the Santa Lucia Range of southwest Atascadero. The Nacimiento fault zone is classified as inactive by CSG but is believed to be coincident with the location of the epicenter for historic earthquakes that suggest the fault is seismically active. Given the uncertainty of the Nacimiento fault's activity, further studies to evaluate the activity of the faults are warranted, prior to placing structures near the mapped fault traces.

Grover Beach: The only mapped fault near Grover Beach is the potentially active Wilmar Avenue fault. The Wilmar Avenue fault is exposed in the sea cliff near Pismo Beach and the buried trace of the fault is inferred to strike northwest-southeast generally along the alignment of U.S. Highway 101 past Grover Beach. The mapped location of the fault runs along a portion of the northern city limits for Grover Beach. The Wilmar Avenue fault is considered potentially active and presents a moderate fault rupture hazard to the City. Further studies to evaluate the activity of the fault are warranted, prior to placing structures near the mapped fault traces.

Morro Bay: The only known mapped faults in the City of Morro Bay are the potentially active Cambria fault and possible splays of the active Los Osos fault system. The Cambria fault is mapped within the eastern limits of the City. The Cambria fault consists of a complex system of thrust faults located primarily in the hills northeast of Morro Bay. The potentially active fault presents a moderate fault rupture hazard to City developments in that area. The Los Osos fault is active but presents essentially no fault rupture hazard to the City as it is only mapped in undeveloped areas. Further studies to evaluate the activity of the faults are warranted, prior to placing structures near the mapped fault traces.

Paso Robles: The only known mapped fault within the City of Paso Robles is the Rinconada fault. The potentially active Rinconada fault is mapped through southwestern Paso Robles and crosses Highway 101 just south of Spring Street. A trace of the fault is also identified as running up Spring Street, which corresponds to a line of hot springs that once existed in this area but have since been capped and buried. As a potentially active fault, the Rinconada presents a moderate fault rupture hazard to the City. Further studies to evaluate the activity of the faults are warranted, prior to placing structures near the mapped fault traces.

The northern end of the potentially active La Panza fault is located about 20 kilometers (12.43 miles) southeast of Paso Robles, near the town of Creston. The northwest striking La

Panza fault is about 75 kilometers (46.6 miles) long. The Huerhuero fault is a possible extension of the La Panza and is mapped trending northwest along Huerhuero Creek south of Highway 46 but is not within the current City limits.

Pismo Beach: There are no mapped active or potentially active faults in Pismo Beach. The inactive Pismo fault presents a very low potential fault rupture hazard. As noted above, the nearby cities of Arroyo Grande and Grover Beach are transected by the Wilmar Avenue fault which is considered potentially active. Based on the USGS Quaternary Faults layer mapped on Figure 5-53, however, nearby faults systems like the San Luis Range and Edna Fault Zones exist. As such, significant ground shaking would be possible near Pismo Beach.

City of San Luis Obispo: CSG has mapped the active Los Osos fault through a portion of the City, which strikes northwest-southeast along the southwestern margin of the Los Osos Valley. Field evaluations for the main strand of the Los Osos fault, found evidence of movement in the last 11,000 years. This evidence of recent activity resulted in the establishment of an Earthquake Fault Zone by CSG in 1989 under the Alquist-Priolo Fault Zoning Act. It should not be interpreted that the active portion of the main trace of the Los Osos Fault is limited only to the designated Earthquake Fault Zone. Rather, the limits of the established zone correspond to the limits of the available information provided in site specific studies that show evidence of recent fault activity in that area. The Los Osos fault presents a high to very high fault rupture hazard to City developments near and southwest of the Los Osos Valley Road area.

Other faults that are near the borders of San Luis Obispo are the West Huasna, Oceanic, and Edna faults. These faults are considered to be potentially active and present a moderate fault rupture hazard to developments in their vicinity.

Unincorporated Areas in San Luis Obispo County

Cambria: Mapped faults in the vicinity of Cambria include the Cambria and Oceanic faults, and the offshore Hosgri fault. Although the offshore Hosgri fault is considered to be active and a likely source for future seismic events, it does not itself provide a fault rupture hazard to onshore facilities. The potentially active Cambria fault consists of a complex web of thrust faults that trend northwest along Highway 1 into the town of Cambria. In the vicinity of Cambria, the fault zone extends from the eastern portion of the town eastward for about two kilometers (1.24 miles).

The potentially active Oceanic fault zone consists of a zone of northwest trending faults located about 8 kilometers (5 miles) northeast of Cambria. Because the faults are considered to be potentially active, they present a moderate fault rupture hazard to the town of Cambria. Further studies to evaluate the activity of the faults are warranted prior to placing structures near the mapped fault traces.

Cayucos: Faults in the vicinity of Cayucos include the Cayucos, Cambria, and Oceanic fault zones. Geologic mapping recorded the buried trace of the northwest striking Cayucos fault beneath the town of Cayucos. The fault is considered to be inactive and therefore results in a low potential to serve as a fault rupture hazard. Although the CSG considers the Cayucos fault to be inactive, it is often undesirable to site structures over any fault as a result of non-uniform foundation support conditions and the potential for co-seismic movement that could result from earthquakes on other nearby faults.

The northwest striking Oceanic fault zone is located about two kilometers (1.24 miles) northeast of Cayucos. The Cambria fault zone is mapped as going offshore north of Cayucos and returning to shore as a broad zone of faults passing through Cayucos. These faults are considered to be potentially active and therefore present a moderate fault rupture hazard. Further studies to evaluate the activity of the faults are warranted, prior to placing structures near the mapped fault traces.

Nipomo: The faults in the Nipomo area include the Santa Maria River, Wilmar Avenue, Oceano and West Huasna faults. The buried trace of the Santa Maria River/Wilmar Avenue fault is inferred to parallel U.S. Highway 101 in the vicinity of Nipomo. The Oceano fault generally is trending northwest across the Nipomo Mesa and into the town of Oceano.

The West Huasna fault is mapped along the eastern side of the valley. These faults generally have a subdued topographic expression and are considered to be potentially active by CSG. Review of the Oceano fault suggests that the fault is inactive. On the basis of that information, potentially active faults

present moderate fault rupture hazard in the Nipomo area. The inactive Oceano fault presents a very low potential as a fault rupture hazard. Although the Oceano fault is inactive, it is often undesirable to site structures over any fault as a result of non-uniform foundation support conditions and the potential for co-seismic movement that could result from earthquakes on other nearby faults. Further studies to evaluate the activity of the Wilmar Avenue and West Huasna faults are warranted, prior to placing structures near the mapped fault traces.

Oceano: The only known mapped fault in the vicinity of Oceano is the Oceano fault. The buried trace of the potentially active Oceano fault is interpreted to strike northwest along the southwestern side of the Cienega Valley about 1,000 meters southwest of Oceano and goes offshore near the mouth of Arroyo Grande Creek. Although the fault is classified as potentially active by CSG, review of the Oceano fault suggests that the fault is inactive. The Oceano fault presents a very low fault rupture hazard to Oceano. Although the Oceano fault is likely inactive, it is often undesirable to site structures over any fault as a result of non-uniform foundation support conditions and the potential for co-seismic movement that could result from earthquakes on other nearby faults.

South Bay: The South Bay area includes the communities of Los Osos, Cuesta by-the-Sea, Baywood Park, and the south Morro Bay area. Mapped faults in the South Bay area include the active Los Osos fault. As mapped the Los Osos fault consists of a several hundred-meter-wide zone of west-northwest striking lineaments and scarps located along the southern side of the Los Osos Valley. Portions of the Los Osos fault have been zoned active by CSG. The activity of this fault segment is unknown but is inferred to be at least potentially active or possibly active. The Los Osos fault and related branches present a moderate to very high fault rupture hazard to the area. Further studies to evaluate the location and activity of the fault are warranted, prior to placing structures near the mapped fault traces.

San Miguel: The data reviewed does not indicate that there are mapped active or potentially active faults in San Miguel.

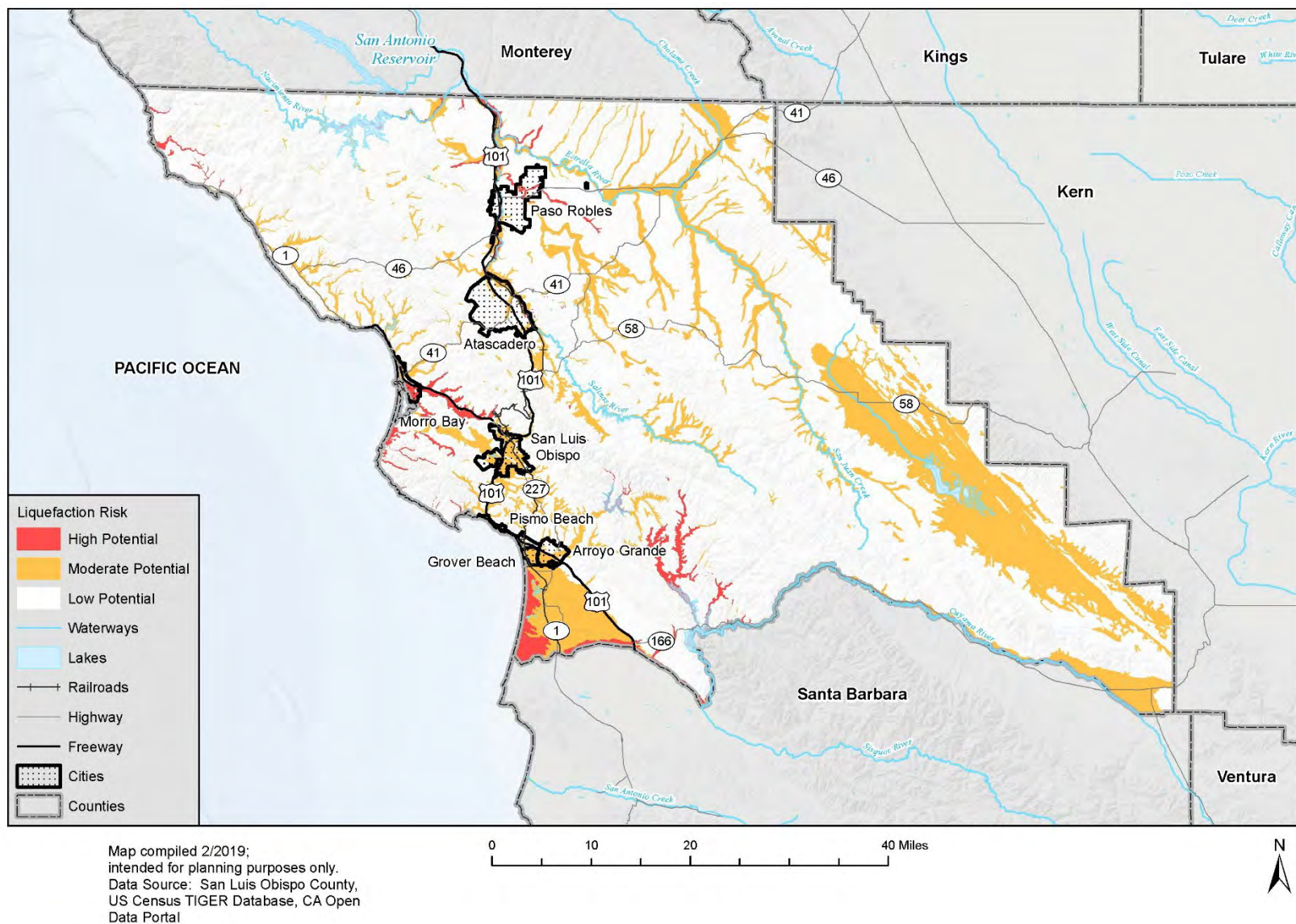
Santa Margarita: The only mapped fault in the Santa Margarita area is the potentially active Rinconada fault. The fault trends northwest through the Santa Margarita area near Pozo Road, Trout Creek, and the Salinas River. Although there is evidence that indicates movement along the Rinconada fault, the fault lacks any geomorphic features to suggest the fault is active. Because the Rinconada fault is potentially active, it poses a moderate fault rupture hazard to this area. Further studies to evaluate the activity of the faults are warranted, prior to placing structures near the mapped fault traces.

Templeton: The only mapped fault in the Templeton area is the western trace of the potentially active Rinconada fault system referred to as the Jolon fault. The fault trends northwest through the community just south of the junction of Highways 46 and 101. Although there is evidence that indicates movement along the Rinconada fault, the fault lacks any geomorphic features to suggest the fault is active. Because the Rinconada fault is potentially active, it poses a moderate fault rupture hazard to this area. Further studies to evaluate the activity of the faults are warranted, prior to placing structures near the mapped fault traces.

Areas Susceptible to Effects of Liquefaction

Figure 5-57 indicates mapping of liquefaction susceptibility for the County. Liquefaction is important to consider for planning purposes as it can lead to ground failure associated with moderate and large earthquakes and contribute to substantial building and infrastructure losses. Descriptions of specific liquefaction risks in the county and its jurisdictions are included below the figure.

Figure 5-57 Liquefaction Susceptibility in San Luis Obispo County



County of San Luis Obispo: Portions of coastal San Luis Obispo County are underlain by sediments that may be vulnerable to liquefaction. Developed areas having a higher potential for liquefaction are the coastal communities of Oceano, Avila, South Bay, Cayucos, and Cambria. Site-specific studies are needed to evaluate if a geologic unit actually contains potentially liquefiable materials and if they require mitigation for development.

Arroyo Grande: The areas of Arroyo Grande that have a high potential to be underlain by potentially liquefiable sediments are those areas underlain by younger alluvium. The younger alluvium underlies most of the low-lying downtown areas south of Branch Street and along Grand Avenue. Site-specific studies are needed to evaluate if a geologic unit actually contains potentially liquefiable materials, and if they require mitigation for development.

Atascadero: The areas of Atascadero that have a high potential to be underlain by potentially liquefiable sediments are those areas underlain by younger alluvium. Portions of the City in the low-lying areas adjacent to Atascadero Creek, Graves Creek, and the Salinas River are mapped as being underlain by younger alluvium. Site-specific studies are needed to evaluate if a geologic unit actually contains potentially liquefiable materials, and if they require mitigation for development.

Grover Beach: The areas of Grover Beach that have a high potential to be underlain by potentially liquefiable sediments are those areas underlain by beach sand and young alluvium. High ground water levels can be expected near the Pacific Ocean and adjacent to Meadow Creek. Site specific studies are needed to evaluate if a geologic unit actually contains potentially liquefiable materials, and if they require mitigation for development.

Morro Bay: The areas of Morro Bay that have a high potential to be underlain by potentially liquefiable sediments are those areas underlain by beach and sand dune deposits and younger alluvium. A majority of the City is underlain by these alluvial, estuarine, beach and sand dune deposits. High ground water levels can be expected in the Embarcadero area and other beach front areas. Flood plain areas along Chorro, Little Morro and Morro Creeks are also underlain by younger alluvium. Site-specific studies are needed to evaluate if a geologic unit actually contains potentially liquefiable materials, and if they require mitigation for development.

Paso Robles: The areas of Paso Robles that have a high potential to be underlain by potentially liquefiable sediments are those areas underlain by younger alluvium. Portions of the City that are located on recent alluvium in the low-lying areas adjacent to the Salinas River (or its tributaries) appear to have the highest potential for liquefaction. Site specific studies are needed to evaluate if a geologic unit actually contains potentially liquefiable materials, and if they require mitigation for development.

City of San Luis Obispo: The areas of the City of San Luis Obispo that have a high potential to be underlain by potentially liquefiable sediments are those areas underlain by younger alluvium. Most of the City of San Luis Obispo is underlain by alluvium. Site specific studies are needed to evaluate if a geologic unit actually contains potentially liquefiable materials, and if they require mitigation for development.

Extent (Magnitude/Severity)

For extent, the severity of an earthquake, or the amount of energy released during an earthquake is usually expressed in terms of intensity or magnitude as described further below.

Intensity: Intensity represents the observed effects of groundshaking at any specified location and earthquake shaking decreases with distance from the earthquake epicenter. Intensity is an expression of the amount of shaking at any given location on the ground surface based on felt or observed effects. Seismic shaking is typically the greatest cause of losses to structures during earthquakes. Intensity is measured with the Modified Mercalli Intensity (MMI) scale. The intensity of ground shaking at a particular site or structure is a function of many factors including: 1) earthquake magnitude, 2) distance from the epicenter, 3) duration of strong ground motion, 4) local geologic conditions (soil type and topography), and 5) the fundamental period of the structure. A brief description of those factors is presented below. The Modified Mercalli Intensity scale is summarized in Table 5-61, along with the effects associated with the MMI scale. Damage typically occurs in MMI of scale VII or above.

Earthquake Magnitude: Magnitude represents the amount of seismic energy released at the hypocenter of an earthquake. It is based on the amplitude of the earthquake waves recorded. Seismologists have developed several magnitude scales; one of the first was the Richter Scale, developed in 1932 by the late Dr. Charles F. Richter of the California Institute of Technology. The Richter scale is numeric and has a logarithmic relationship between scale factors, so that a difference of one scale number represents a tenfold increase in measured amplitude, which in turn corresponds to an approximate 31x energy release difference when compared to the next whole number value. The Moment Magnitude scale (M_w , or M), which is a measurement of energy released by the movement of a fault and is the modern method used by seismologists to measure earthquakes. Overall, as the amount of energy released by an earthquake increases, the potential for ground shaking impacts also increases.

Distance from Epicenter: Earthquake energy generally dissipates (or attenuates) with distance from a fault. Over long distances, this loss of energy can be significant, resulting in a significant decrease in ground shaking with increased distance from the epicenter.

Duration of Strong Shaking: The duration of the strong ground shaking constitutes a major role in determining the amount of structural damage and the potential for ground failure that can result from an earthquake. Larger magnitude earthquakes have longer durations than smaller earthquakes.

Local Geologic Conditions: The geologic and soil conditions at a particular site have the potential to substantially increase the effects of ground shaking. The thickness, density, and consistency of the soil, as well as shallow ground water levels, have the potential to amplify the effects of ground shaking depending on the characteristics of the earthquake. In general, the presence of unconsolidated soils above the bedrock surface can amplify the ground shaking caused by an earthquake.

Fundamental Periods: Every structure has its own fundamental period or natural vibration. If the vibration of ground shaking coincides with the natural vibration period of a structure, damage to the structure can be greatly increased. The extent of damage suffered during an earthquake can also depend on non-geologic factors. The type of building and its structural integrity will influence the severity of the damage suffered. Generally, small, well-constructed, one- and two-story wood and steel frame buildings have performed well in earthquakes because of their light weight and flexibility. Reinforced concrete structures will also usually perform well. Buildings constructed from non-flexible materials, such as unreinforced brick and concrete, hollow concrete block, clay tile, or adobe, are more vulnerable to earthquake damage.

Effects of Ground Shaking: The primary effect of ground shaking is the damage or destruction of buildings, infrastructure, and possible injury or loss of life. Building damage can range from minor cracking of plaster to total collapse. Disruption of infrastructure facilities can include damage to utilities, pipelines, roads, and bridges. Ruptured gas and water lines can result in fire and produce scour/inundation damage, respectively, to structures, as can fire from other causes, such as electrical damages. Secondary effects can include geologic impacts such as co-seismic fault movement along nearby faults, seismically induced slope instability, liquefaction, lateral spreading, and other forms of ground failure and seismic response. These secondary effects were demonstrated in Oceano by the San Simeon 2003 earthquake.

Table 5-61 Earthquake Magnitude and Intensity Measurements and Associated Characteristics

Magnitude	Mercalli Intensity	Effects	Frequency
Less than 2.0	I	Microearthquakes, not felt or rarely felt; recorded by seismographs.	Continual
2.0-2.9	I to II	Felt slightly by some people; damages to buildings.	Over 1M per year
3.0-3.9	II to IV	Often felt by people; rarely causes damage; shaking of indoor objects noticeable.	Over 100,000 per year
4.0-4.9	IV to VI	Noticeable shaking of indoor objects and rattling noises; felt by most people in the affected area; slightly felt outside; generally, no to minimal damage.	10K to 15K per year
5.0-5.9	VI to VIII	Can cause damage of varying severity to poorly constructed buildings; at most, none to slight damage to all other buildings. Felt by everyone.	1K to 1,500 per year
6.0-6.9	VII to X	Damage to a moderate number of well-built structures in populated areas; earthquake-resistant structures survive with slight to moderate damage; poorly designed structures receive moderate to severe damage; felt in wider areas; up to hundreds of miles/kilometers from the epicenter; strong to violent shaking in epicentral area.	100 to 150 per year
7.0-7.9	VIII <	Causes damage to most buildings, some to partially or completely collapse or receive severe damage; well-designed structures are likely to receive damage; felt across great distances with major damage mostly limited to 250 km from epicenter.	10 to 20 per year
8.0-8.9	VIII <	Major damage to buildings, structures likely to be destroyed; will cause moderate to heavy damage to sturdy or earthquake-resistant buildings; damaging in large areas; felt in extremely large regions.	One per year
9.0 and Greater	VIII <	At or near total destruction - severe damage or collapse to all buildings; heavy damage and shaking extends to distant locations; permanent changes in ground topography.	One per 10-50 years

Source: USGS



Past Occurrences

Where earthquakes have struck before, they will strike again. The central California coast has a history of damaging earthquakes, primarily associated with the San Andreas fault. However, there have been a number of magnitude 5.0 to 6.5 earthquakes on other faults which have affected large portions of the Central Coast. Recent events include the December 2003 - 6.5 magnitude San Simeon Earthquake and the September 2004 - 6.0 magnitude Parkfield Earthquake.

Historically active faults are generally thought to present the greatest risk for future movement and, therefore, have the greatest potential to result in fault rupture hazards. Active and potentially active faults in San Luis Obispo County are shown on map found on page 41 (Map 2 from the San Luis Obispo County Safety Element).

The areas of San Luis Obispo County most susceptible to the effects of liquefaction are those areas underlain by young, poorly consolidated, saturated granular alluvial sediments. These soil conditions are most frequently found in areas underlain by recent river and flood plain deposits. The map found on page 43 indicates areas of low to high liquefaction potential based on the geologic units (Map 3 from the San Luis Obispo County Safety Element).

Following are historic earthquakes that have affected San Luis Obispo County:

1830 San Luis Obispo Earthquake. The 1830 earthquake is noted in the annual report from the Mission and had an estimated magnitude of 5. The location of the event is poorly constrained and cannot be attributed to a specific fault source, but the earthquake reportedly occurred somewhere near San Luis Obispo.

1857 Fort Tejon Earthquake. The approximate 7.9 Fort Tejon earthquake of 1857 was one of the greatest earthquakes ever recorded in the United States. It left a surface rupture scar over 350 kilometers (210 miles) in length along the San Andreas Fault and a maximum surface offset of about 9 meters (30 feet). Yet, despite the immense scale of this quake, only two people were reported killed by the effects of the shock. The location of the epicenter is not known. As the name suggests, one idea is to locate it near the area of strongest reported shaking, Fort Tejon. However, because there is evidence that foreshocks to the 1857 earthquake may have occurred in the Parkfield area, it is located near the northwestern end of the surface rupture, just southeast of Parkfield, near Cholame, on a map produced by the Southern California Earthquake Data Center (<http://www.data.scec.org/significant/forttejon1857.html>).

The fact that only two lives were lost was primarily due to the nature of the quake's setting. California in 1857 was sparsely populated, especially in the regions of strongest shaking, and this fact, along with good fortune, kept the loss of life to a minimum. The effects of the quake were quite dramatic, even frightening. Were the Fort Tejon shock to happen today, the damage would easily run into billions of dollars, and the loss of life would likely be substantial, as the present-day communities of Wrightwood, Palmdale, Frazier Park, and Taft (among others) all lie upon or near the 1857 rupture area.

1906 San Francisco Earthquake. This earthquake has been studied in detail and the effects in San Luis Obispo County have been documented. Modified Mercalli intensity ratings ranged from III-IV in the inland and north coast portions of the County, and IV-V in the south coast areas. The higher intensities were felt in areas underlain by alluvial soil, while the lower intensities occurred in areas underlain by bedrock formations.

1916 Avila Beach Earthquake. This magnitude 5.1 event occurred offshore of Avila Beach in San Luis Bay. The earthquake reportedly resulted in tumbling smokestacks of the Union Oil Refinery at Port San Luis, and a landslide that blocked the railroad tracks.

The maximum intensity appears to be approximately VI, but the available descriptions of the shaking are somewhat limited.

1952 Arvin-Tehachapi Earthquake. This 7.7 magnitude earthquake occurred on the White Wolf fault, located south and west of Bakersfield. Throughout most of the San Luis Obispo County, ground shaking intensities of VI were felt. Intensities of IV-V were experienced in the northwest portion of the County, and magnitude VIII intensities were felt in the Cuyama area, in the southeast portion of the County. The higher intensities were likely due to closer proximity to the earthquake epicenter.

1952 Bryson Earthquake. This magnitude 6.2 earthquake likely occurred on the Nacimiento fault and resulted in intensity ratings of VI throughout most of the western portion of the County. Intensities of IV-V were experienced in the eastern portion of the County. Higher intensities were generally felt in the coastal valley areas that are underlain by alluvial soils.

1934, 1966 and 2004 Parkfield Earthquakes. These earthquakes were all three in the range of magnitude 6.0 and occurred on the San Andreas fault in or near the northeast corner of the County. Earthquake intensities generally conformed to anticipated characteristics for events of this size, with intense shaking (VII-VIII) being limited to a relatively small area near the epicenters of the quakes. Moderate shaking was experienced in most of the central and western parts of the County. A variation from the expected intensity characteristics was experienced in the La Panza area during the 1934 earthquake. La Panza is approximately 40 miles south of the fault rupture area, but experienced earthquake intensities of VII.

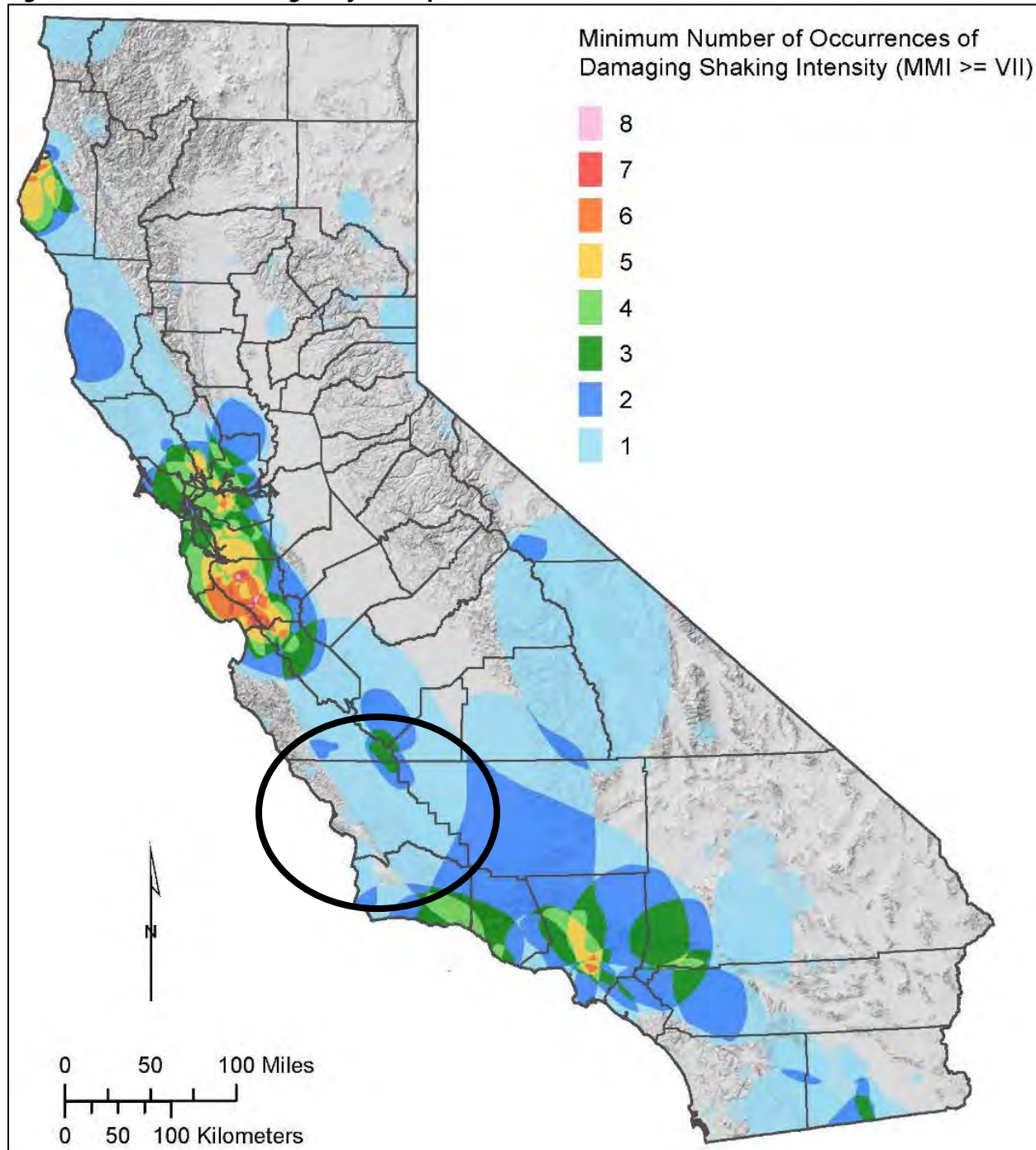
2003 San Simeon Earthquake. The San Simeon Earthquake struck at 11:15 a.m. on December 22, 2003. The magnitude 6.5 earthquake is attributed to having occurred near the San Simeon/Oceanic/Hosgri Fault system. The epicenter was approximately six miles from the community of San Simeon. In addition to significant property and other damages, two fatalities resulted from damages caused by the earthquake. The nearest affected city was Paso Robles. Perhaps not surprisingly, the issue of retrofitting unreinforced masonry buildings began to receive more attention as a result of this damaging earthquake. It was also reported that of the 53 unreinforced masonry buildings in the city, none of the 9 retrofitted buildings experienced major damages. However, unreinforced ones continue to prove highly dangerous across the county and the state, often partially or completely collapsing during earthquake events such as this one.

2014 Earthquake west of the San Simeon Fault, near Cambria. This was a rather weak seismic event of a 4.1 Magnitude about 14 kilometers south-southwest of San Simeon. It had a depth of 2.9 km and occurred on February 6 of 2014, beginning at approximately 7:42pm (UTC time). No damages were reported but the ground shaking was weakly felt on several communities including Cambria, Cayucos, Lake Nacimiento, Templeton, Morro Bay, Paso Robles, Atascadero, Los Osos, San Miguel, and Shandon.

Earthquakes which have occurred outside yet felt in the County during the last century include events such as the 7.0 Lompoc earthquake in 1927, and the 7.7 Arvin-Tehachapi earthquake of 1952. Other more recent earthquakes, such as the 1983 - 6.7 Coalinga earthquake, 1989 - 7.1 Loma Prieta earthquake, 1992 - 7.5 Landers earthquake and the 1994 - 6.6 Northridge earthquake were felt in San Luis Obispo County, but there was no damage to structures from these.

The map below displays the common areas damaged by earthquakes based on historic evidence dating back to the year 1800. The occurrences are color-coded by damaging shaking intensity across the state of California, and the county of San Luis Obispo is enclosed within a black circle. The figure shows that, per the Modified Mercalli Intensity scale noting occurrences equal to or greater than an intensity of 8, the county has experienced 1 to 3 earthquake events of this kind.

Figure 5-58 Areas Damaged by Earthquakes from the Year 1800 to 2017



Source: California State Hazard Mitigation Plan, 2018; California Geologic Survey

Probability of Future Occurrences

Likely - It is estimated that major earthquakes (ranging from a magnitude of 7 to 7.9) occur in California 1 out of every 10 years. However, strong earthquakes (from magnitudes 6 to 6.9) strike the state about once every two to three years. A strong earthquake can cause major damage depending on the epicenter's location with regards to populated areas, and can lead to billions of dollars in disasters, deaths, injuries, and disruptions in services and communities' way of life. Moderate earthquakes (around magnitudes of 5.5) can occur three to four times a year in the state. The San Simeon event in 2003 which affected Paso Robles caused 2 deaths, 47 injuries, and \$263 million in damages. Per Figure 5-58 above, additionally, historical evidence shows that an earthquake of intensity 8 or greater is expected to occur 1 to 3 times every 200 hundred or so years.

Climate Change Considerations

While climate change is not expected to directly affect earthquake frequency or intensity; it could exacerbate indirect or secondary impacts of earthquakes. For example, climate change could increase the frequency and intensity of extreme precipitation events, in turn increasing the probability of landslides and liquefaction events during an earthquake if the earthquake coincided with a wet cycle. (Natural Resources Agency, 2018; California's Fourth Climate Change Assessment, 2018).

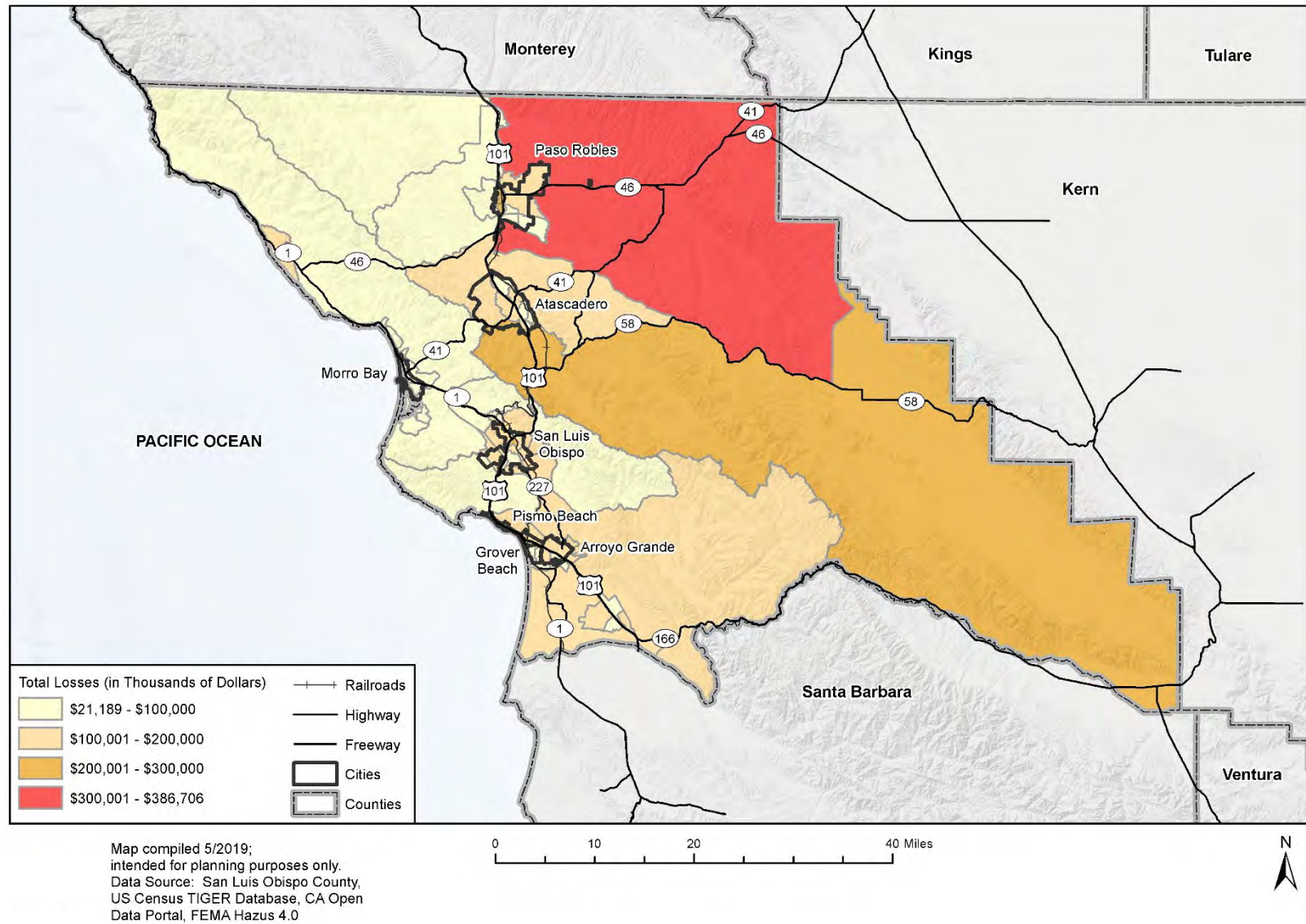
Vulnerability to Earthquake

Earthquake loss estimation for the 2019 HMP update utilized FEMA's Hazus-MH 4.0 natural hazard loss estimation software. Hazus is a GIS based, standardized, nationally applicable multi-hazard loss estimation methodology and software. Local, state and federal government officials use Hazus for preparedness, emergency response, and mitigation planning. A level 1 Hazus analysis was performed which estimates damage based on an inventory database compiled at a national level aggregated to Census Tracts. As with any model there are uncertainties and the results should be considered approximate for planning purposes.

To evaluate potential losses associated with earthquake activity in the planning area, a Hazus 2,500-year probabilistic scenario was run for the county of San Luis Obispo. The 2,500-year scenario represents a worst-case level of shaking that considers multiple faults in the region. The methodology utilizes probabilistic seismic hazard contour maps developed by the U.S. Geological Survey (USGS) for the 2014 update of the National Seismic Hazard Maps that are included with HAZUS-MH. The USGS maps provide estimates of potential ground acceleration and spectral acceleration at periods of 0.3 second and 1.0 second, respectively. The 2,500-year return period analyzes ground shaking estimates from the various seismic sources in the area with a 2 percent probability of being exceeded in 50 years. The International Building Code uses this level of ground shaking for building design in seismic areas.

Hazus estimates the number of people displaced, the number of buildings and facilities/infrastructure damaged, the number of casualties, and the damage to transportation systems and utilities. Results produced by Hazus are reported by at the census tract level. The figure below displays the census tracts within the county and which were analyzed in this scenario, color-coded by the amount of total losses each tract experienced. The map is followed by the Hazus results broken up in respective sections.

Figure 5-59 Hazus Earthquake Analysis for San Luis Obispo County – Total Losses by Census Tracts (in Thousands of Dollars)



General Property (Earthquake)

Unreinforced Masonry Building (URM)s: Unreinforced masonry building type structures consist of buildings made of unreinforced concrete and brick, hollow concrete blocks, clay tiles, and adobe. Buildings constructed of these materials are heavy and brittle, and typically provide little earthquake resistance. In small earthquakes, unreinforced buildings can crack, and in strong earthquakes, they have a tendency to collapse. These types of structures pose the greatest structural risk to life and safety of all general building types. Due to the public safety risks that are posed by unreinforced masonry buildings, the California legislature passed Senate Bill 547 (Government Code Section 8875 et seq.). This legislation went into effect January 1, 1987, and required all cities and counties located in Seismic Zone 4, which includes San Luis Obispo County, to conduct an inventory of potentially hazardous structures, including unreinforced masonry buildings.

To comply with the requirements of SB 547, the County of San Luis Obispo adopted the Uniform Code for Building Conservation as part of Title 19 (Building and Construction Ordinance) of the County Code. Surveys that were conducted to identify potentially unsafe unreinforced masonry buildings identified about 80 structures that required modifications to meet specified earthquake resistance structural standards. Identified structures that require seismic retrofit are generally located in various areas, mostly urban. The County's ordinance implementing SB 547 requires the owners of identified unreinforced buildings to demolish the structures or complete modifications, depending upon the building's use and number of occupants. As of June 2019, only four structures remain on the URM registry. These buildings have had URM parcel tags applied and include the following:

- Sims Hotel – San Miguel
- Templeton Forest – Templeton
- Shandon Valley Inn – Shandon
- Oceano Bar/Critter Korner – Oceano

Fault Rupture Risk: The most significant damage from fault rupture is anticipated in areas that are designated as such through the Alquist Priolo Fault Zoning Act. While future development is restricted in these areas the following table summarizes a GIS analysis of parcel center points that intersect the AP Fault Zones.

Table 5-62 Parcels at Risk to Fault Rupture - Alquist-Priolo Zones

Jurisdiction	Seismic Designation	Property Type	Property Count	Improved Value
CITY OF SAN LUIS OBISPO	Los Osos Alquist-Priolo	Residential	28	\$9,541,741
		Residential: Other	2	\$693,134
TOTAL			30	\$10,234,875
Unincorporated	Estero Fault Area	Agricultural	1	\$849,393
		Government/Utilities	1	--
		Residential	7	\$1,789,318
		Mobile/Manufactured Homes	4	\$1,197,306
		Vacant	2	\$78,190
	Los Osos Alquist-Priolo	Government/Utilities	1	--
		Other/Exempt/Misc.	1	--

Jurisdiction	Seismic Designation	Property Type	Property Count	Improved Value
		Residential	29	\$18,800,436
	San Andreas Alquist-Priolo	Agricultural	2	\$8,185
		Government/Utilities	4	--
		Other/Exempt/Misc.	1	--
		Residential	4	\$622,397
		Vacant	6	\$809,245
		San Simeon Alquist-Priolo	Government/Utilities	1
	Other/Exempt/Misc.		1	--
	Residential		1	\$8,171
	TOTAL			66
GRAND TOTAL			96	\$34,397,516

Source: County of San Luis Obispo Planning and Building; Wood Plc Parcel Analysis

Non-structural items and building components can also influence the amount of damage that buildings suffer during an earthquake. Unreinforced parapets, chimneys, facades, signs, and building appendages can all be shaken loose, creating a serious risk to life and property.

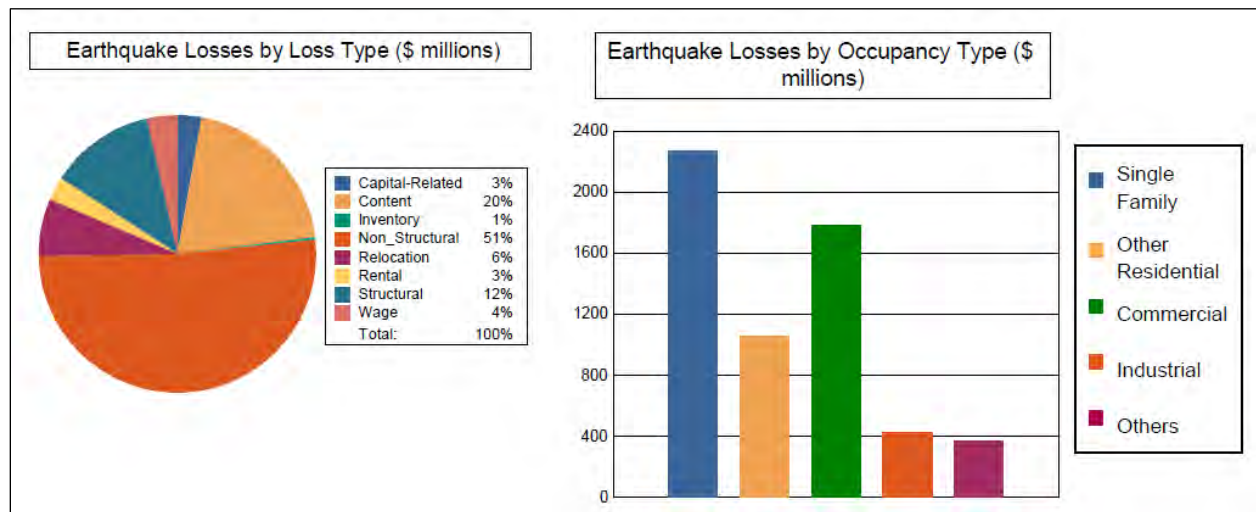
Hazus Results: There are an estimated 109 thousand buildings in the region with a total building replacement value (excluding contents) of \$32 billion. In terms of building construction types found in the region, wood frame construction makes up 83% of the building inventory.

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

The total building-related losses were \$5.9 billion. By far, the largest loss was sustained by the residential occupancies which made up over 56% of the total loss. The figure and table below provide a summary of the losses associated with the building damage.

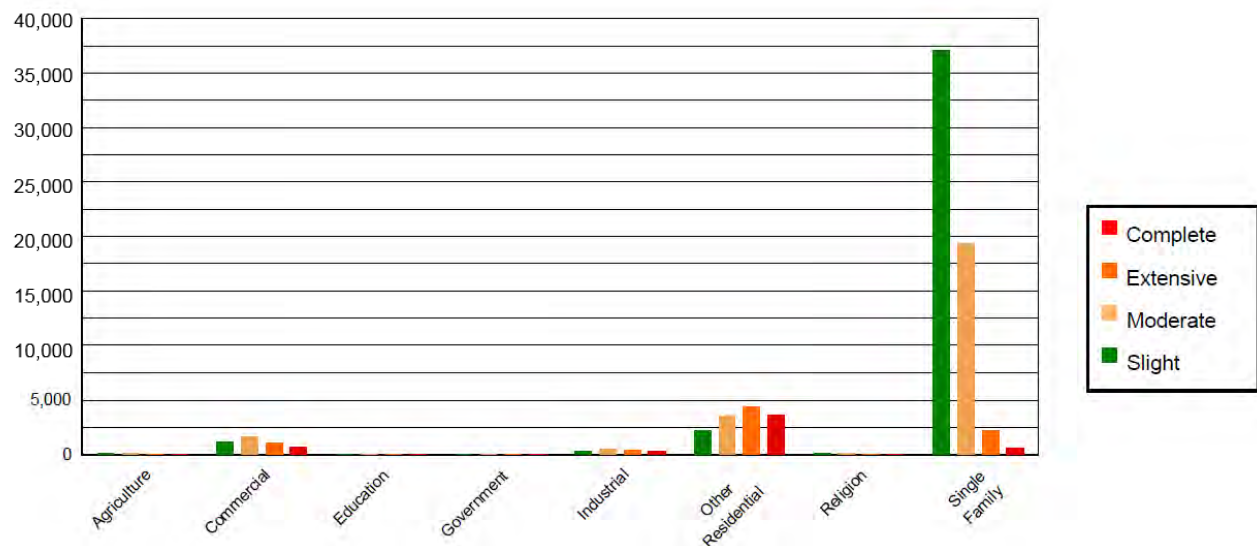


Figure 5-60 Earthquake Losses by Loss Type and Occupancy Type (in Millions of Dollars)



Source: Hazus-MH 4.0

Figure 5-61 Hazus 2,500 Probabilistic Earthquake Scenario Structure Damage by Occupancy Type



Source: Hazus-MH 4.0

Hazus estimates that about 39,034 buildings will be at least moderately damaged. This is over 36% of the total number of buildings in the region. There are an estimated 5,298 buildings that will be damaged beyond repair. Table 5-63 summarizes the expected damage by property occupancy type in more detail, whereas Table 5-64 contains the results of the expected building damage by building material type.

Table 5-63 Expected Building Damage by Occupancy Class

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Agriculture	95	0.32	133	0.32	142	0.56	79	0.96	61	1.16
Commercial	820	2.78	1,114	2.72	1,635	6.42	1,102	13.35	660	12.46
Education	43	0.15	52	0.13	52	0.20	27	0.32	14	0.27
Government	24	0.08	30	0.07	40	0.16	29	0.36	19	0.36
Industrial	206	0.70	306	0.75	509	2.00	380	4.60	271	5.11
Other Residential	1,390	4.71	2,224	5.42	3,550	13.93	4,429	53.65	3,620	68.32
Religion	86	0.29	110	0.27	128	0.50	84	1.02	52	0.97
Single Family	26,867	90.98	37,053	90.32	19,426	76.23	2,124	25.73	602	11.37
Total	29,531		41,024		25,482		8,254		5,298	

Source: Hazus-MH 4.0

Table 5-64 Expected Building Damage by Building Material (All Design Levels)

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Wood	28,144	95.30	38978	95.01	20,427	80.16	2,238	27.12	685	12.93
Steel	160	0.54	244	0.59	586	2.30	550	6.67	343	6.46
Concrete	275	0.93	396	0.97	466	1.83	327	3.97	205	3.87
Precast	180	0.61	270	0.66	512	2.01	350	4.25	207	3.90
RM	665	2.25	570	1.39	855	3.36	540	6.54	232	4.37
URM	39	0.13	72	0.17	139	0.55	117	1.42	138	2.60
MH	67	0.23	495	1.21	2,497	9.80	4,131	50.04	3,490	65.87
Total	29,531		41,024		25,482		8,254		5,298	

*Note:

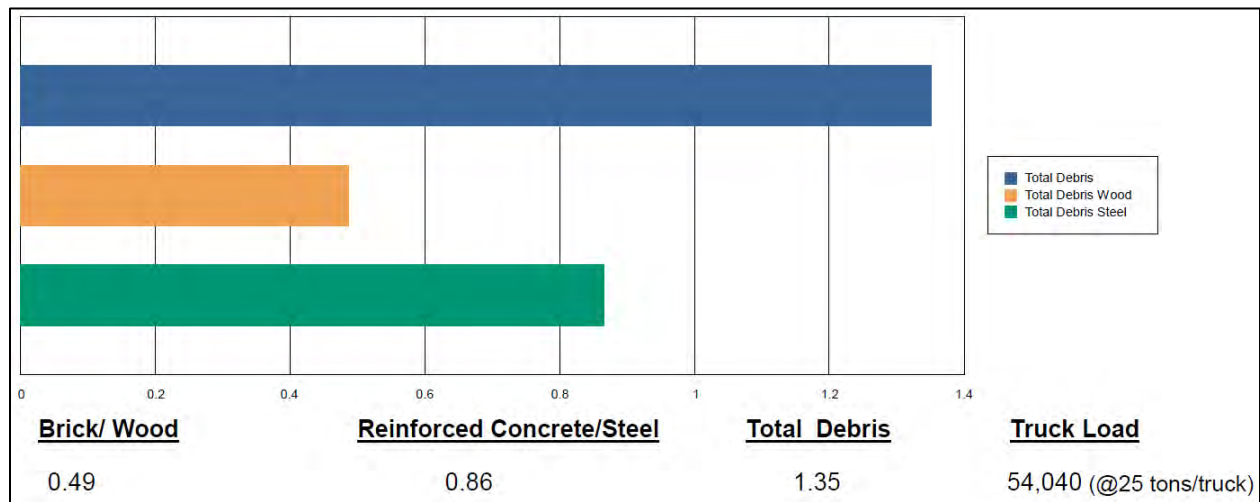
RM Reinforced Masonry
URM Unreinforced Masonry
MH Manufactured Housing

Source: Hazus-MH 4.0

Hazus also estimates the amount of debris that will be generated by the earthquake event analyzed. The model subdivides the debris into two general categories: a) Brick/Wood, and b) Reinforced Concrete/Steel. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 1.35 million tons of debris will be generated. Of that total amount, Brick/Wood comprises 36% of the debris, while the remainder would be Reinforced Concrete/Steel. If the debris tonnage was converted to estimates of truckloads required to remove it, debris generated would convert to about 54,040 truckloads, with each truckload carrying 25 tons. Figure 5-62 summarizes the debris generation and material type for this earthquake event.

Figure 5-62 Debris Generation in Millions of Tons and by Material Type



Source: Hazus-MH 4.0

People (Earthquake)

Shelter Requirement: Hazus estimates the number of households that are expected to be displaced from their homes due to the earthquake and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 3,063 households to be displaced due to the earthquake. Of these, 2,146 people (out of a total population of 269,637) will seek temporary shelter in public shelters.

Casualties: Ground movement during an earthquake is seldom the direct cause of death or injury. Most earthquake-related injuries result from collapsing walls, flying glass, and falling objects as a result of the ground shaking, or people trying to move more than a few feet during the shaking. Hazus estimates the number of people that will be injured and killed by the earthquake. The casualties are broken down into four severity levels that describe the extent of the injuries. The levels are described as follows:

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

The casualty estimates are provided for three times of day: 2:00 AM, 2:00 PM and 5:00 PM. These times represent the periods of the day that different sectors of the community are at their peak occupancy loads. The 2:00 AM estimate considers that the residential occupancy load is at its maximum. The 2:00 PM estimate considers that the educational, commercial and industrial sector loads are at their maximum. The 5:00 PM represents peak commute time. These estimates of casualties are broken down in Table 5-65.

Social Vulnerability

Earthquake is a high significance hazard across the county due to past event history as well as the prominent presence of faults (including portions of active and potentially active faults on the eastern slopes). Because of this, the entire county's population is exposed in some way to this hazard. Based on

the Social Vulnerability Index (SoVI) data presented and discussed in subsection 4.4.1, some of the most socially vulnerable areas of the County are also exposed to earthquake hazards. This includes: Paso Robles, where the Rinconada and San Andreas fault zone are in the vicinity; Morro Bay, crossed by parts of the Cambria fault zone; the city of San Luis Obispo, crossed by the Edna and Cambria fault zones; Grover Beach and Oceano area, where San Luis Range fault system fault zones are present; and Nipomo, which is in proximity to the San Luis Range fault system, West Huasna fault zone, and smaller zones such as the Garey faults.

Populations most vulnerable to earthquake and liquefaction activity would be those that rely on specific services or electrical power, which may not be available during or after a quake, or those which are homeless, would have a difficult time evacuating due to age or disability, cannot communicate easily due to speaking English less than well, for example.

Table 5-65 Hazus Earthquake Casualty Estimates from San Luis Obispo County

		Level 1	Level 2	Level 3	Level 4
2 AM	Commercial	23	7	1	2
	Commuting	0	0	0	0
	Educational	0	0	0	0
	Hotels	0	0	0	0
	Industrial	28	8	1	2
	Other-Residential	600	146	14	26
	Single Family	299	45	3	4
	Total	950	206	20	35
2 PM	Commercial	1,312	380	62	121
	Commuting	2	2	4	1
	Educational	505	146	24	47
	Hotels	0	0	0	0
	Industrial	206	59	9	18
	Other-Residential	129	31	3	6
	Single Family	64	10	1	1
	Total	2,217	628	103	194
5 PM	Commercial	930	269	44	85
	Commuting	31	40	68	13
	Educational	113	32	5	10
	Hotels	0	0	0	0
	Industrial	129	37	6	11
	Other-Residential	220	54	5	10
	Single Family	116	18	1	2
	Total	1,538	449	130	131

Source: Hazus-MH 4.0

Critical Facilities and Infrastructure (Earthquake)

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

Essential Facility Damage: There are 7 hospitals in the region with a total bed capacity of 1,484 beds. There are 105 schools, 19 fire stations, 14 police stations and 1 emergency operation facility. The inventory also includes 28 hazardous material sites, 0 military installations and 1 nuclear power plant.

On the day of the earthquake, the model estimates that only 713 hospital beds (48%) are available for use by patients already in the hospital and those injured by the earthquake. After one week, 90% of the beds will be back in service. By 30 days, 99% will be operational. The essential facility inventory and expected damages from the earthquake event are provided in Table 5-66.

Transportation Systems Inventory: Within Hazus, the lifeline inventory is divided between transportation and utility lifeline systems. There are 7 transportation systems that include highways, railways, light rail, bus, ports, ferry and airports. There are 6 utility systems that include potable water, wastewater, natural gas, crude & refined oil, electric power and communications. The transportation systems inventory and expected damages from the earthquake, in terms of number of structures and locations affected, are provided in Table 5-67, while losses in millions of dollars are summarized in Table 5-68. The total value of the lifeline inventory is over \$5.77 billion. This inventory includes over 812 kilometers (504.5 miles) of highways, 357 bridges, and 20,068 kilometers (12,469.6 miles) of pipes.

Utility Lifeline Systems Inventory: The replacement value of the transportation and utility lifeline systems combined is estimated to be \$4.4 billion and \$1.3 billion, respectively. The expected utility system facility damages in terms of total structures or systems affected, along with the inventory of this dataset, are summarized in Table 5-69. Economic losses in millions of dollars are found in Table 5-70. Site specific expected utility system pipeline damages (including their inventory) are included in Table 5-71, while the potable water and electric power system performance limitations, damages, and inventory will be in Table 5-72.



Table 5-66 Essential Facility Inventory and Expected Damage

Classification	Total	# Facilities		
		At Least Moderate Damage > 50%	Complete Damage > 50%	With Functionality > 50% on day 1
Hospitals	7	0	0	0
Schools	105	0	0	0
EOCs	1	0	0	0
PoliceStations	14	0	0	0
FireStations	19	0	0	0

Source: Hazus-MH 4.0



Table 5-67 Transportation Systems Inventory and Expected Damage by Number of Locations

System	Component	Number of Locations_				
		Locations/ Segments	With at Least Mod. Damage	With Complete Damage	With Functionality > 50 %	
					After Day 1	After Day 7
Highway	Segments	222	0	0	222	222
	Bridges	357	54	8	305	317
	Tunnels	0	0	0	0	0
Railways	Segments	15	0	0	15	15
	Bridges	8	0	0	8	8
	Tunnels	0	0	0	0	0
	Facilities	3	3	0	1	3
Light Rail	Segments	0	0	0	0	0
	Bridges	0	0	0	0	0
	Tunnels	0	0	0	0	0
	Facilities	0	0	0	0	0
Bus	Facilities	11	11	0	7	11
Ferry	Facilities	0	0	0	0	0
Port	Facilities	0	0	0	0	0
Airport	Facilities	2	2	0	1	2
	Runways	4	0	0	4	4

Source: Hazus-MH 4.0



Table 5-68 Transportation System Economic Losses in Millions of Dollars

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Highway	Segments	3,711.93	\$0.00	0.00
	Bridges	425.58	\$57.82	13.59
	Tunnels	0.00	\$0.00	0.00
	Subtotal	4,138	57.80	
Railways	Segments	104.32	\$0.00	0.00
	Bridges	0.85	\$0.08	8.85
	Tunnels	0.00	\$0.00	0.00
	Facilities	7.99	\$3.66	45.82
	Subtotal	113	3.70	
Light Rail	Segments	0.00	\$0.00	0.00
	Bridges	0.00	\$0.00	0.00
	Tunnels	0.00	\$0.00	0.00
	Facilities	0.00	\$0.00	0.00
	Subtotal	0	0.00	
Bus	Facilities	14.15	\$6.47	45.76
	Subtotal	14	6.50	
Ferry	Facilities	0.00	\$0.00	0.00
	Subtotal	0	0.00	
Port	Facilities	0.00	\$0.00	0.00
	Subtotal	0	0.00	
Airport	Facilities	21.30	\$9.92	46.56
	Runways	151.86	\$0.00	0.00
	Subtotal	173	9.90	
	Total	4,438.00	78.00	

Source: Hazus-MH 4.0



Table 5-69 Expected Utility System Facility Inventory and Damages

System	Component	# Locations / Segments	Replacement value (millions of dollars)
Potable Water	Distribution Lines	NA	200.70
	Facilities	1	39.30
	Pipelines	0	0.00
	Subtotal		240.00
Waste Water	Distribution Lines	NA	120.40
	Facilities	8	628.70
	Pipelines	0	0.00
	Subtotal		749.10
Natural Gas	Distribution Lines	NA	80.30
	Facilities	0	0.00
	Pipelines	0	0.00
	Subtotal		80.30
Oil Systems	Facilities	2	0.20
	Pipelines	0	0.00
	Subtotal		0.20
Electrical Power	Facilities	2	259.60
	Subtotal		259.60
Communication	Facilities	34	4.00
	Subtotal		4.00
		Total	1,333.20

System	# of Locations				
	Total #	With at Least Moderate Damage	With Complete Damage	with Functionality > 50 %	
				After Day 1	After Day 7
Potable Water	1	1	0	0	1
Waste Water	8	8	0	0	6
Natural Gas	0	0	0	0	0
Oil Systems	2	2	0	0	0
Electrical Power	2	2	0	0	2
Communication	34	34	0	0	34

Source: Hazus-MH 4.0



Table 5-70 Utility System Economic Losses in Millions of Dollars

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Potable Water	Pipelines	0.00	\$0.00	0.00
	Facilities	39.30	\$16.47	41.92
	Distribution Lines	200.70	\$24.10	12.01
	Subtotal	239.98	\$40.58	
Waste Water	Pipelines	0.00	\$0.00	0.00
	Facilities	628.70	\$233.58	37.15
	Distribution Lines	120.40	\$17.28	14.35
	Subtotal	749.11	\$250.85	
Natural Gas	Pipelines	0.00	\$0.00	0.00
	Facilities	0.00	\$0.00	0.00
	Distribution Lines	80.30	\$4.95	6.17
	Subtotal	80.27	\$4.95	
Oil Systems	Pipelines	0.00	\$0.00	0.00
	Facilities	0.20	\$0.08	32.58
	Subtotal	0.24	\$0.08	
Electrical Power	Facilities	259.60	\$95.82	36.91
	Subtotal	259.60	\$95.82	
Communication	Facilities	4.00	\$1.53	38.18
	Subtotal	4.01	\$1.53	
	Total	1,333.22	\$393.81	

Source: Hazus-MH 4.0

Table 5-71 Expected Utility System Pipeline Damage (Site Specific)

System	Total Pipelines Length (kms)	Number of Leaks	Number of Breaks
Potable Water	10,034	5357	1339
Waste Water	6,021	3839	960
Natural Gas	4,014	1101	275
Oil	0	0	0

Source: Hazus-MH 4.0

Table 5-72 Expected potable Water and Electric Power System Performance

	Total # of Households	Number of Households without Service				
		At Day 1	At Day 3	At Day 7	At Day 30	At Day 90
Potable Water	102,016	63,709	61,931	58,085	27,091	0
Electric Power		76,869	49,542	21,771	4,580	102

Source: Hazus-MH 4.0

Diablo Canyon Power Plant: Located just north of Avila Beach this nuclear power plant was designed in the late 60's and the first unit was put in service in 1985. Equipped with extensive seismic monitoring and safety systems, the plant is designed to shut down promptly in the event of significant ground motion. The HMPC noted that the Diablo Canyon Power Plant has been determined to withstand earthquake shaking, although the powerlines from the plant are still a concern.

Diablo Canyon was originally designed to withstand a 6.75 magnitude earthquake. However, before its completion it was upgraded to withstand a 7.5 magnitude quake. This action was required based on the discovery of the Hosgri Fault located just off shore of the plant's location.

Bridges: The County of San Luis Obispo 2014 Bridge Maintenance Program report indicates 10 bridges due for replacement or rehabilitation; three bridges that are slated for seismic retrofits include:

- Avila Beach Drive over San Luis Obispo Creek
- South Bay Blvd Bridge over Los Osos Creek
- Lopez Drive Bridge over Lopez Lake

The document also notes procedures for post-earthquake bridge inspections.

During the planning process the HMPC noted the following additional critical facilities and infrastructure that could be of concern in an earthquake event: the transcontinental fiber optic line as well as microwave communication site on mountain tops; State Water Project pipelines and the high-pressure gas and petroleum pipelines to Kern County that cross the San Andreas fault.

In addition, a GIS overlay analysis was performed on the seismic designation hazard areas across the county with a combination of the county-provided critical facilities and the Homeland Infrastructure Foundation-Level Data, or HIFLD layers. The purpose was to find which critical facilities are found at risk of these seismic designation zones (Alquist-Priolo fault areas). The only critical facilities found at risk within the Los Osos Alquist-Priolo hazard area were two microwave service towers in the unincorporated area of the county.

Economy (Earthquake)

Hazus estimates the long-term economic impacts to the region. The model quantifies this information in terms of income and employment changes within the region. The total economic loss estimated for the earthquake is \$6.3 B, which includes building and lifeline related losses based on the region's available inventory. An estimated 16% of losses computed by Hazus were related to the business interruption of the region.

Since the building losses are broken into two categories (of direct building losses compared to business interruption losses), building related losses, which summarize estimates costs to fix or replace structures

and damages to properties and their contents are discussed in more detail in the General Property section of this section.

However, business interruption losses are summarized herein. They included the temporary living expenses for people displaced from their homes because of the earthquake event. These business-related economic losses are included in Table 5-73 below.

Table 5-73 Business-Related Economic Loss Estimates in Millions of Dollars

Category	Area	Single Family	Other Residential	Commercial	Industrial	Others	Total
Income Losses							
	Wage	0.00	24.71	169.04	5.78	9.02	208.55
	Capital-Related	0.00	10.55	149.11	3.41	2.53	165.60
	Rental	47.34	53.44	68.54	2.07	4.81	176.20
	Relocation	170.34	51.86	109.67	11.46	36.75	380.08
	Subtotal	217.68	140.56	496.36	22.72	53.11	930.43
Capital Stock Losses							
	Structural	245.85	136.31	220.08	50.75	63.74	716.72
	Non_Structural	1,330.77	627.13	712.88	198.13	159.06	3,027.96
	Content	477.10	148.68	344.86	128.45	85.22	1,184.30
	Inventory	0.00	0.00	8.36	19.80	3.14	31.30
	Subtotal	2,053.72	912.11	1,286.17	397.12	311.16	4,960.29
	Total	2,271.40	1,052.68	1,782.53	419.84	364.26	5,890.71

Source: Hazus-MH 4.0

Historic, Cultural, and Natural Resources (Earthquake)

Earthquake effects on the environment, natural resources, and historic and cultural assets could be very destructive depending on the type of seismic activity experienced and secondary/cascading effects from an event (e.g. wildfire). The biggest impact would likely be on older properties such as wooden or masonry buildings, though reinforced masonry structures would be much more resilient during earthquakes.

No historic properties or structures were found within Alquist-Priolo seismic hazard designation areas.

Future Development (Earthquake)

Future development in the county is not anticipated to significantly affect vulnerability to earthquakes when designed according to modern building codes. However future development will result in a slight increase in exposure of the population, building stock, and related infrastructure to earthquakes.

A GIS overlay analysis of building construction permits for residential and commercial properties was additionally performed across the county, pulling from permits submitted from 2014 to early 2019. This assessment provides a general idea of how many future properties may be constructed, or may have upgrades completed, in Alquist-Priolo seismic designation hazard areas (Table 5-74).

Table 5-74 Business Permits Submitted in Alquist-Priolo Seismic Designation Areas from 2014-2019

Seismic Hazard Designation	Work Class	Case Type	Work Class Type Total
Estero Fault Area	New Structure	PMTC - Commercial Permit	1
Los Osos Alquist-Priolo		PMTR - Residential Permit	2
San Andreas Alquist-Priolo			1
TOTAL			4

Source: San Luis Obispo County Planning & Building Department, Wood GIS analysis

Vulnerability to Liquefaction

When liquefaction of the soil does occur, buildings and other objects on the ground surface may tilt or sink, and lightweight buried structures (such as pipelines) may float toward the ground surface. Liquefied soil may be unable to support its own weight or that of structures, which could result in loss of foundation bearing or differential settlement. Liquefaction may also result in the development of cracks in the ground surface followed by the emergence of a sand/water mixture, typically referred to as a sand-boil. In areas underlain by thick deposits of saturated, loose granular sediment (such as alluvial valleys or beaches), subsidence as much as several feet may result. Based on parcel and liquefaction risk overlay analysis, the following sections summarize how this hazard risk affects the county of San Luis Obispo.

General Property (Liquefaction)

Liquefaction activity, particularly that occurring along the coast of the County could have devastating effects in terms of property damage to properties and resources. During the 2019 update of this plan, a GIS analysis of improved property exposure to liquefaction risk areas was performed. GIS analysis indicates approximately over \$10 billion in improved values of parcels found within moderate liquefaction risk areas, while \$735 million in improved parcel values are found within high liquefaction risk zones. About \$104 billion of that value is within unincorporated county areas, with over \$3 billion from the moderate liquefaction risk areas and over \$197 million from the high liquefaction risk zones. The table below summarizes the improved values for both moderate and high liquefaction risk areas based on hazard category, while Figure 5-63 displays the parcels found within either of these two liquefaction risk areas.

Table 5-75 Liquefaction by Parcel Type and Risk Category, San Luis Obispo County

Liquefaction Risk Category	Property Type	Property Count	Improved Value
Moderate Risk	Agricultural	216	\$112,651,942
	Commercial	2,230	\$1,539,438,419
	Government/Utilities	787	\$1,923,876
	Other/Exempt/Misc.	1,597	\$409,054,734
	Residential	26,125	\$5,710,198,939
	Mobile/Manufactured Homes	1,330	\$159,234,782
	Multi-Family Residential	4,710	\$1,184,672,592
	Residential: Other	2,079	\$622,532,626
	Industrial	151	\$133,363,653
	Vacant	584	\$162,471,832
	TOTAL	39,809	\$10,035,543,395

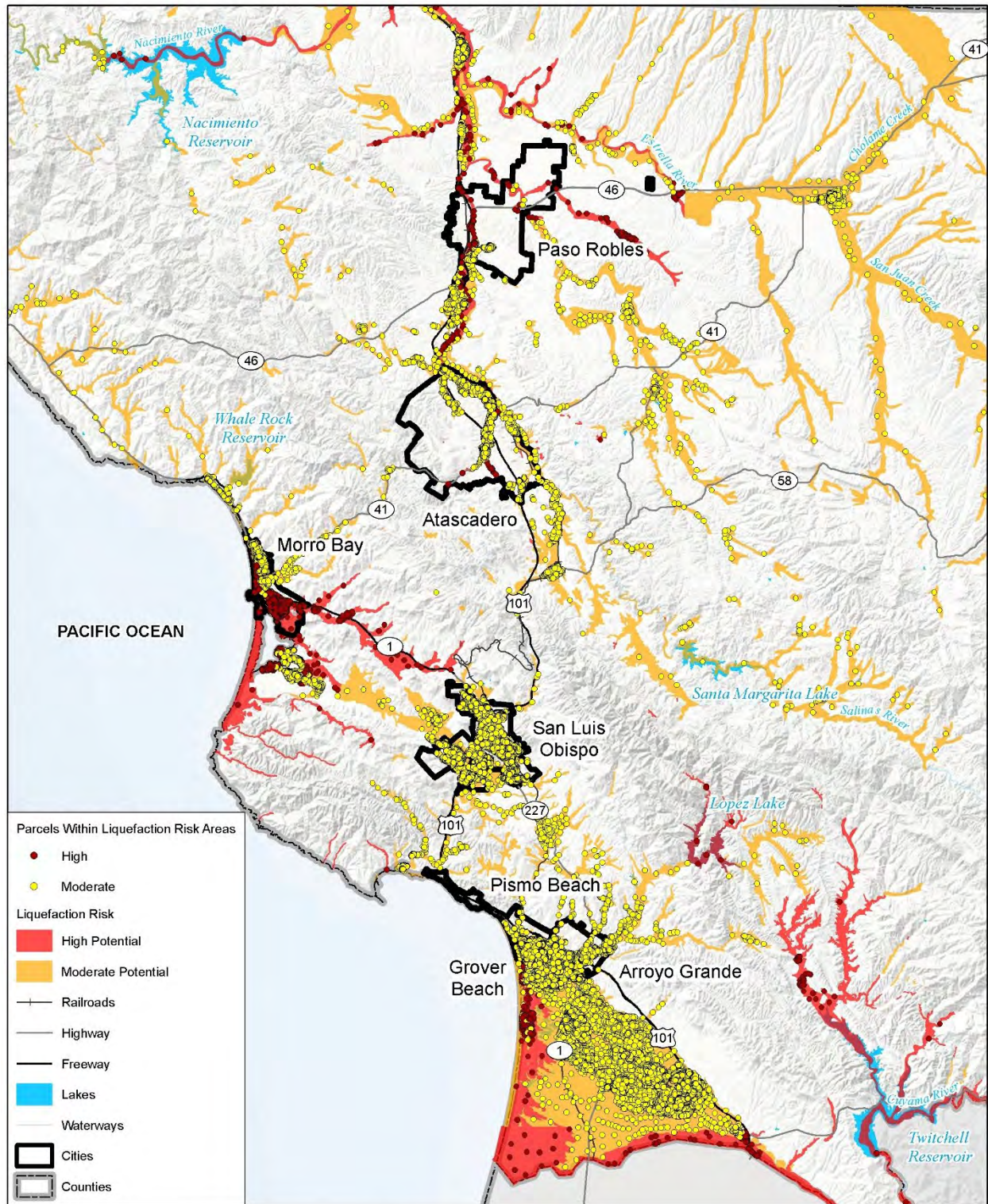


Liquefaction Risk Category	Property Type	Property Count	Improved Value
High Risk	Agricultural	16	\$8,129,234
	Commercial	210	\$68,599,828
	Government/Utilities	182	\$287,709
	Other/Exempt/Misc.	258	\$24,060,579
	Residential	2177	\$439,558,043
	Mobile/Manufactured Homes	27	\$8,729,206
	Multi-Family Residential	378	\$104,981,846
	Residential: Other	135	\$66,773,018
	Industrial	8	\$5,951,546
	Vacant	48	\$8,181,331
	TOTAL	3,439	\$735,252,340
GRAND TOTAL		3,439	\$10,770,795,735

Source: SLO County Planning and Building, and Assessor's Office; ParcelQuest; Wood Plc Parcel Analysis



Figure 5-63 **Parcels Within Moderate or High Liquefaction Risk Areas – San Luis Obispo County**



Map compiled 3/2019;
intended for planning purposes only.
Data Source: San Luis Obispo County,
US Census TIGER Database, CA Open
Data Portal, ParcelQuest

Critical Facilities and Infrastructure (Liquefaction)

Liquefaction during major earthquakes can cause severe damage to infrastructures on level ground as a result of settling, tilting, or floating, particularly those that may already be particularly vulnerable due to existing structural deficiencies, age, or even scouring (e.g. bridges). Table 5-76 and Table 5-77 summarize how many and which type of critical facilities (from the combination of the county-provided facilities as well as the Homeland Infrastructure Foundation-Level Data, or HIFLD layers) are found within liquefaction risk areas. The first table contains the results by jurisdiction, then the second by liquefaction risk category. These were obtained from a GIS overlay analysis of critical facilities as well as liquefaction risk layers. The majority are found in moderate risk zones within unincorporated portions of the county.

Table 5-76 Critical Facilities within Liquefaction Risk Areas, by Jurisdiction

Liquefaction Risk Category	Count
Arroyo Grande	22
Atascadero	9
Grover Beach	12
Morro Bay	17
Paso Robles	2
San Luis Obispo	69
Unincorporated	105
TOTAL	236

Source: San Luis Obispo County Planning & Building Department, HIFLD, Wood GIS analysis

Table 5-77 Critical Facilities within Liquefaction Risk Areas, by Liquefaction Risk Category

Liquefaction Risk Category	Count
Moderate	220
High	16
TOTAL	236

Source: San Luis Obispo County Planning & Building Department, HIFLD, Wood GIS analysis

An analysis of bridges within areas of liquefaction risk was also performed, with the results of the overlay analysis summarized in Table 5-78 below. Bridges with critical scour conditions were counted as well, since already weakened structures of this kind would be more highly susceptible to damages or destruction during liquefaction events, further impairing transportation routes, commodity transmissions, etc.

Table 5-78 Bridges and Scour Status in Liquefaction Risk Areas

Liquefaction Risk Category	Total Bridges	Scour Critical Total
Moderate	233	101
High	46	23
TOTAL	279	124

Source: Wood Analysis on National Bridge Inventory data, 2018

Historic, Cultural, and Natural Resources (Liquefaction)

GIS Analysis indicates that 29 historic and cultural properties are vulnerable to liquefaction. 25 of them are found within moderate liquefaction risk areas, whereas 4 of them in high liquefaction risk areas. Details on the specific properties at risk can be obtained in Appendix E Critical Facilities.

Future Development (Liquefaction)

Areas slated for future development should consider potential impacts from liquefaction and soil instability, particularly development of new critical facilities in areas with vulnerable populations (e.g. schools). A GIS overlay analysis of building construction permits for residential and commercial properties was additionally performed across the county, pulling from permits submitted from 2014 to early 2019. This assessment provides a general idea of how many future properties may be constructed, or may have upgrades completed, in moderate, high, or very high liquefaction risk areas (see Table 5-79).

Table 5-79 Building Permits Submitted in Liquefaction Risk Areas from 2014-2019

Liquefaction Risk	Work Class	Case Type	Work Class Type Total
Moderate	New Structure	PMTR - Residential Permit	1,331
		PMTC - Commercial Permit	307
	Minor Use Permit	Land Use	189
	Conditional Use Permit	Land Use	169
	TOTAL		1,996
High	New Structure	PMTR - Residential Permit	32
		PMTC - Commercial Permit	29
	Minor Use Permit	Land Use	71
	Conditional Use Permit	Land Use	7
	TOTAL		139
GRAND TOTAL			2,135

Source: San Luis Obispo County Planning & Building Department, Wood GIS analysis

Risk Summary (Earthquake and Liquefaction)

- San Luis Obispo County is located in a geologically complex and seismically active region. There are numerous active and potentially active faults in the County. The County has a history of damaging earthquakes, including those associated with the San Andreas fault, but there have also been a number of magnitude 5.0 to 6.2 earthquakes which have affected large portions of the County.
- The overall significance of earthquakes and liquefaction is high.
- A moderate earthquake occurring in or near San Luis Obispo County could result in deaths, casualties, property damage, agricultural and environmental damage, and disruption of normal government and community services and activities.
- The location of the epicenter as well as the time of day and season of the year would have a profound effect on the number of deaths and casualties, as well as property damage.
- The hazard of earthquakes varies from place to place, dependent upon the regional and local geology.
- There is significant building and other infrastructure exposed to potentially liquefiable soils



- *Effects on people:* Hazus probabilistic scenario modeling of worst-case ground shaking results in estimates of 200-700 people needing hospitalization and between 35-194 deaths depending on the time of day the earthquake hits.
- *Effects on property:* Hazus probabilistic scenario modeling indicates about 39,034 buildings will be at least moderately damaged, with approximately \$5.9 billion in losses. The County has removed or retrofitted the majority of unreinforced masonry buildings.
- *Effects on economy:* The total economic loss estimated for a large earthquake is \$6.3 billion, which includes building and lifeline related losses based on the region's available inventory. An estimated 16% of losses computed by Hazus were related to the business interruption of the region.
- *Effects on critical facilities and infrastructure:* *Essential facility damage* (police, fire, school, medical) is predicted to be low; only 713 hospital beds (48%) would be available during the earthquake. Utility lifeline systems impacts would be significant particularly to bridges; moderate damage can be expected to water, wastewater, power and communications facilities; loss of water and power would be significant in the days and weeks following the earthquake. For the GIS analysis with the liquefaction layer, though, it was found that a total of 236 critical facilities are at risk of moderate or high liquefiable soil areas, with most of these found in unincorporated portions of the county. The Alquist-Priolo layer analysis yielded two facilities within Los Osos Alquist Priolo areas, which are seismic hazard designation areas in the unincorporated county.
- *Cascading and Secondary Effects:* Earthquakes can cause many cascading effects such as fires, flooding, hazardous materials spills, utility disruptions, landslides, and transportation emergencies. Ground shaking may cause tsunamis or seiche, the rhythmic sloshing of water in lakes or bays.
- *Related hazards:* Landslides, Subsidence, Tsunami

Table 5-80 Earthquake Risk Summary

Jurisdiction	Geographic Area	Probability of Future Occurrence	Magnitude/Severity (Extent)	Overall Significance
San Luis Obispo County	Extensive	Occasional	Critical	High
City of Arroyo Grande	Significant	Highly Likely	Critical	High
City of Atascadero	Limited	Unlikely	Limited	Low
City of Grover Beach	Extensive	Occasional	Critical	High
City of Morro Bay	Significant	Occasional	Catastrophic	High
City of Paso Robles	Significant	Likely	Critical	High
City of Pismo Beach	Extensive	Occasional	Limited	Medium
City of San Luis Obispo	Extensive	Occasional	Catastrophic	High
Avila Beach CSD	Extensive	Unlikely	Critical	Medium
Ground Squirrel Hollow CSD	Limited	Occasional	Negligible	Medium
Heritage Ranch CSD	Extensive	Occasional	Catastrophic	High
Los Osos CSD	Extensive	Likely	Critical	High
Nipomo CSD	Extensive	Likely	Limited	Medium
San Miguel CSD	Extensive	Likely	Critical	High
San Simeon CSD	Significant	Likely	Limited	High

Jurisdiction	Geographic Area	Probability of Future Occurrence	Magnitude/Severity (Extent)	Overall Significance
Templeton CSD	Significant	Unlikely	Limited	Low
Cayucos Sanitary District	Extensive	Occasional	Limited	High
Port San Luis Harbor District	Extensive	Likely	Critical	Medium
San Luis Obispo FCWCD	Extensive	Occasional	Critical	High
South San Luis Obispo Sanitation District	Significant	Highly Likely	Critical	High



5.3.11 Flooding

Hazard/Problem Definition

Floods are among the most frequent and costly natural disasters in terms of human hardship and economic loss and are usually caused by weather events. Floods can cause substantial damage to structures, landscapes, and utilities as well as life safety issues. Certain health hazards are also common to flood events. Standing water and wet materials in structures can become breeding grounds for microorganisms such as bacteria, mold, and viruses. This can cause disease, trigger allergic reactions, and damage materials long after the flood. When floodwaters contain sewage or decaying animal carcasses, infectious disease becomes a concern. Direct impacts, such as drowning, can be limited with adequate warning and public education about what to do during floods. Where flooding occurs in populated areas, warning and evacuation will be of critical importance to reduce life and safety impacts.

The area adjacent to a river or stream channel is the floodplain. Floodplains are illustrated on inundation maps, which show areas of potential flooding and water depths. In its common usage, the floodplain most often refers to the area that is inundated by the 100-year flood, the flood that has a one percent (1%) chance in any given year of being equaled or exceeded. The 100-year flood is the national minimum standard to which communities regulate their floodplains through the National Flood Insurance Program (NFIP). The 500-year flood is the flood that has a 0.2 percent chance of being equaled or exceeded in any given year. A 500-year flood event would be slightly deeper and cover a greater area than a 100-year flood event. The potential for flooding can change and increase through various land use changes and changes to land surface, which can result in a change to the floodplain. A change in environment can create localized flooding problems inside and outside of natural floodplains by altering or confining natural drainage channels. These changes are most often created by human activity.

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San Luis Obispo County is susceptible to various types of flood events as described below.

Riverine flooding - Riverine flooding, defined as the condition when a watercourse (e.g. river or channel) exceeds its "bank-full" capacity, generally occurs as a result of prolonged rainfall, or rainfall that is combined with already saturated soils from previous rain events. This type of flood occurs in river systems whose tributaries may drain large geographic areas and include one or more independent river basins. The onset and duration of riverine floods may vary from a few hours to many days. Factors that directly affect the amount of flood runoff include precipitation amount, intensity and distribution, the amount of soil moisture, seasonal variation in vegetation, snow depth, and water-resistance of the surface due to urbanization. In the San Luis Obispo planning area, flooding is largely caused by heavy and continued rains, and heavy flow from tributary streams. These intense storms can overwhelm the local waterways as well as the integrity of any flood control structures. The warning time associated with slow rise floods assists in life and property protection.

Localized flooding - Localized flooding problems are often caused by flash flooding, severe weather, or an unusual amount of rainfall. Flooding from these intense weather events usually occurs in areas

experiencing an increase in runoff from impervious surfaces associated with development and urbanization as well as inadequate storm drainage systems.

Dam or Levee failure flooding - Flooding from failure of one or more upstream dams or water control structures such as levees is also a concern to San Luis Obispo County. A catastrophic flood control structural failure could easily overwhelm local response capabilities to save lives and require mass evacuations towards the north and east of the planning area. Impacts to life safety will depend on the warning time and the resources available to notify and evacuate the public. Loss of life could result, and there could be associated health concerns as well as negative effects to local buildings and infrastructure. Dam failure is addressed in more detail under the Dam Failure section, while levee failures and other aspects related to localized flood problem areas are discussed throughout this section.

Coastal flooding - Coastal floods come from the Pacific Ocean where large waves are and can be affected by storm surge. Coastal floods can be very dangerous when high waters are combined with the destructive forces of waves. In low-lying coastal areas, storm surge and flooding can reach many miles from the shoreline, flowing up rivers and across flat land (FEMA, 2018). In San Luis Obispo County, coastal flooding is attributed with the following mechanisms: (1) swell runup from intense offshore winter storms in the Pacific; (2) tsunamis from Aleutian-Alaskan and Peruvian-Chilean Trenches or other off-shore faults; (3) runup from wind waves generated by landfalling storms; (4) swell runup from waves generated off Baja California by tropical cyclones; (5) Effects of landfalling tropical cyclones (FEMA, 2012). Wave runup refers to the height above the tide and surge elevation and can depend on the local water levels, wave action, and beach structure. Coastal flooding hazards is addressed in more detail under the Coastal Storms/Coastal Erosion/Sea Level Rise section.

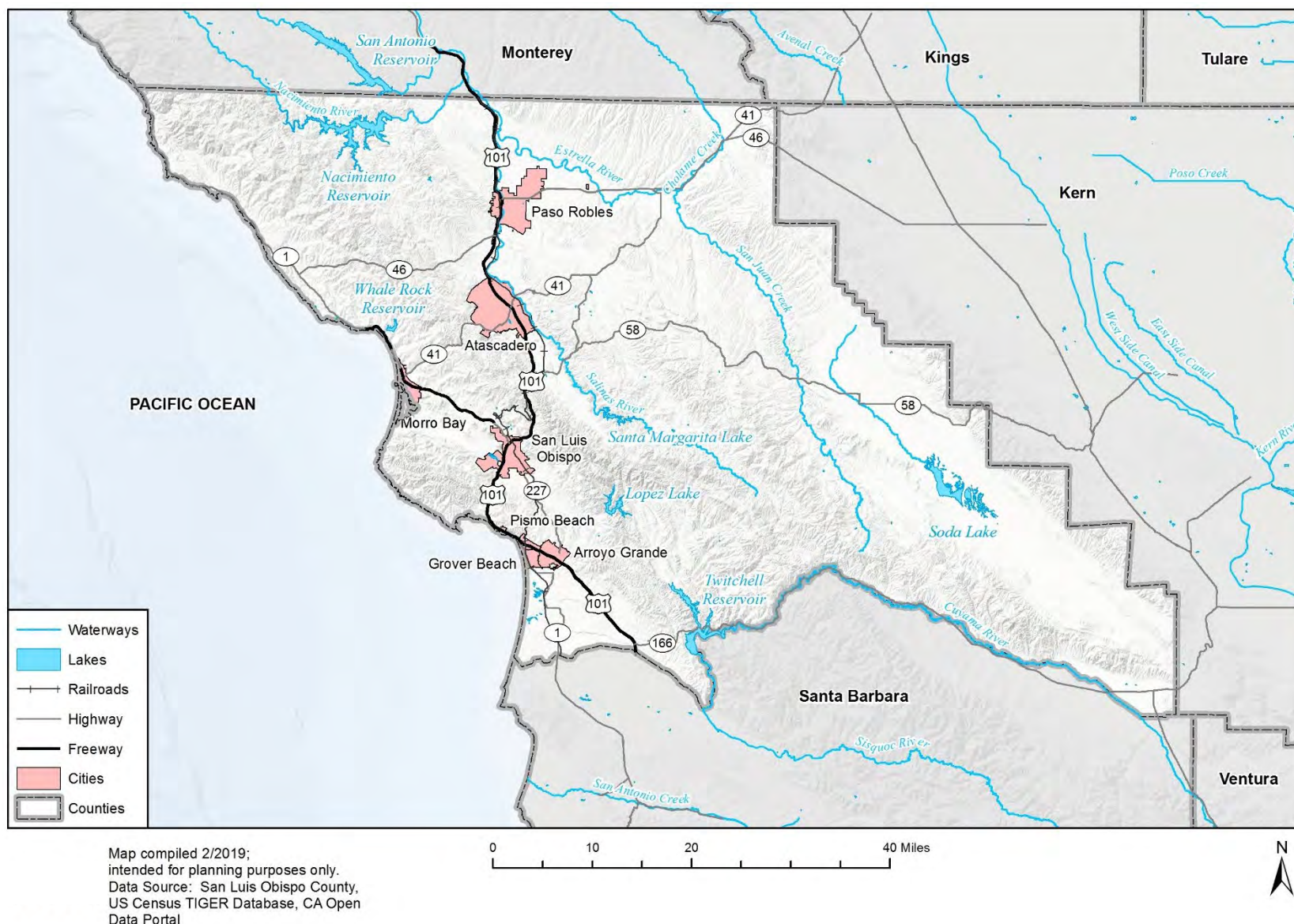
Geographic Area

The Flood Insurance Study conducted by FEMA for San Luis Obispo County noted that runoff in the streams of the county is small, with appreciable flows occurring only during and immediately after precipitation. However, during large storms stream flow increases rapidly and flood waters can contain high amounts of debris, causing major flood damage. For many of the water courses that are located in the County, areas that may be inundated in response to 100-year storm events are located adjacent to or near the stream or river channel. Since many of the County's watercourses are located in mountainous or remote areas with little or no development, flooding events along these rivers and streams generally result in minimal impacts. Other watercourses in the County, however, have floodplains that extend well beyond the defined stream or river channel. When a flood occurs along one of these watercourses, and it is located in or near an area that is urbanized, damage to property and infrastructure can be widespread.

In the southern portion of San Luis Obispo County, Arroyo Grande Creek, San Luis Obispo Creek, and their respective tributaries, flow through urbanized areas and have caused major floods. The north coast area of the county also contains several short, steep-gradient creeks that can experience rapid increases in water flows in response to storm events in Cambria. The largest water course in the inland portion of the county is the Salinas River, which is located adjacent to numerous incorporated and unincorporated communities. Other major inland water courses include the Estrella River and San Juan Creek. Due to the generally remote locations of these watercourses, flooding impacts are generally not significant.

Figure 5-64 below shows the waterways located in the county.

Figure 5-64 San Luis Obispo County Major Waterways



There have been several studies related to water resources and watersheds in San Luis Obispo County. Due to the varied topography, previous water-related planning efforts have identified 25 watershed areas in three sub-regions (North Coast, South County, North County) of the county. The San Luis Obispo County Stormwater Resource Plan (2018), further grouped these watershed areas into nine “Watershed Groups” based on hydrologic boundaries, previously identified watershed areas, and grouped areas of similar physiographic and land-use characteristics. Note, while this plan was being updated the County was also in the process of updating the Integrated Regional Water Management Plan (IRWMP) which will incorporate the Stormwater Resource Plan. The IRWMP update will revise the nine water planning areas into six groups. The following are descriptions of the three watershed regions in the county as they have been described in the County’s 2018 Stormwater Resource Plan.

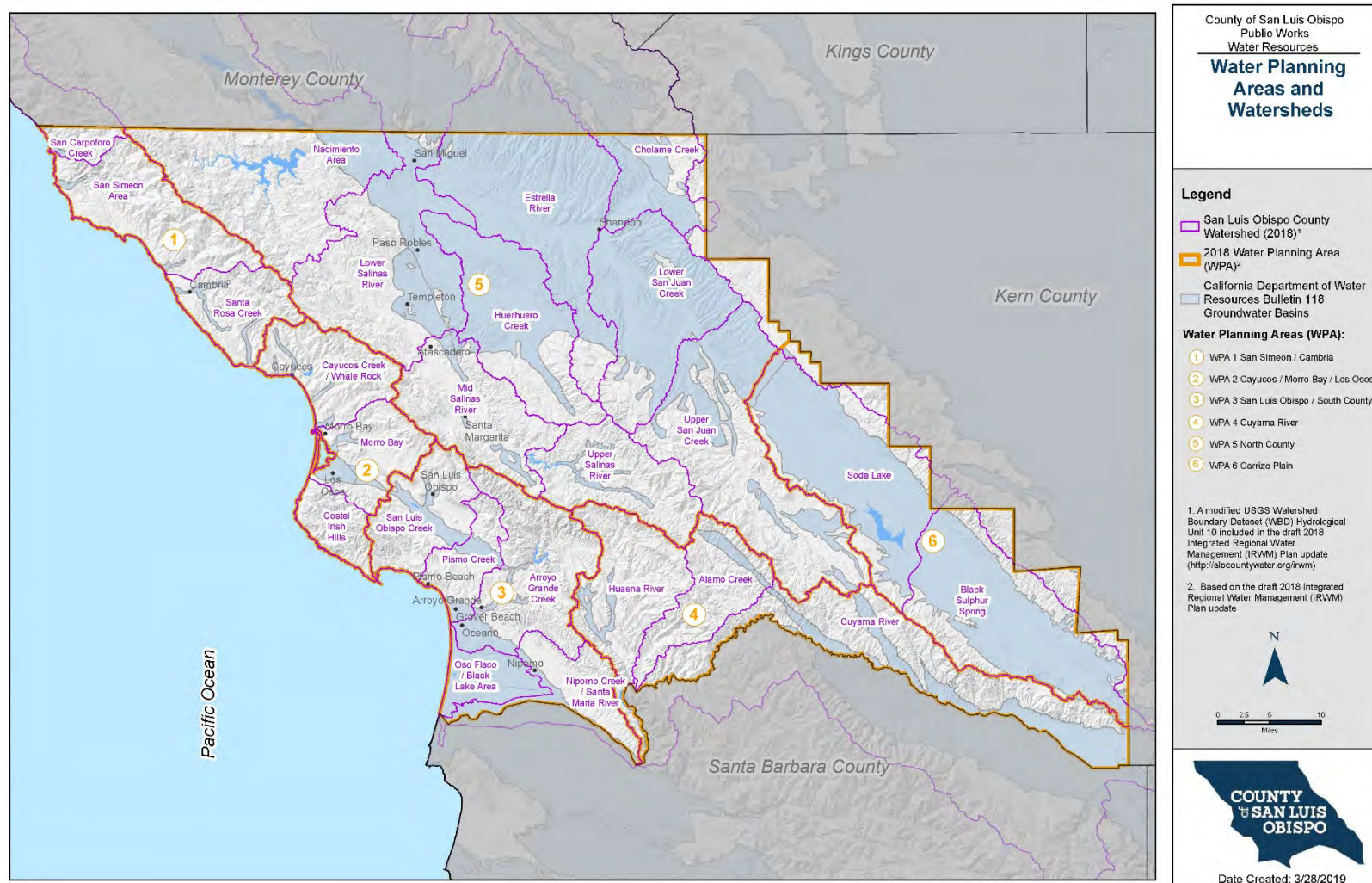
Coastal Watersheds: These watersheds drain out of the Santa Lucia Range into the Pacific Ocean. Most of the channels here are relatively short and flow to the west and southwest. In the most southerly part of this coastal region, a relatively broad coastal plain has developed from deposition of the ancestral Santa Maria River, now occupied by the communities of Shell Beach, Pismo Beach, Arroyo Grande, Grover Beach, Oceano, and Nipomo. Moving north, ancient sedimentary and metamorphic rocks of the Irish Hills limit the extent of coastal development until Los Osos Valley breaches the range front and reaches the coastline, and where the communities of Los Osos and Morro Bay are built upon the now-drowned estuary of Los Osos Creek and Chorro Creek. Even farther north, the same metamorphic rocks again encroach upon the coast without respite, leaving room only for the scattered communities of San Simeon, Cambria, and Cayucos on uplifted marine terraces only a few hundred thousand years old, plastered onto the side of the steeply descending Santa Lucia Range.

Area Between the Santa Lucia and Temblor Ranges: Watersheds in this area drain north into the Salinas and Estrella rivers. These rivers meet just upstream (south) of the Monterey County line and continue north as the Salinas River enters the Pacific Ocean in Monterey Bay. Their headwaters lie far to the south—the Salinas River emerges from Santa Margarita Lake, the Estrella River from San Juan Creek, with the two separated by the northwest-trending spur of the La Panza Range. This topography not only has guided the overall drainage patterns of the central county, but also has limited the opportunities for transportation corridors to reach into this central region. Thus, the population centers in this region (Atascadero, Templeton, Paso Robles, San Miguel) are limited to the river valley below its headwaters.

Southeast Corner of County: These watersheds drain either south, into the Cuyama River, or into the closed depression of the Carrizo Plain between the southern extent of the Temblor Range and the Caliente Range. There are no significant urban areas within this region, and only short, limited drainage courses down the mountain slopes into either the Cuyama River or the alluvial plain surrounding Soda Lake.

Figure 5-65 from the San Luis Obispo County Stormwater Resource Plan depicts the various watershed groupings in the county.

Figure 5-65 San Luis Obispo County Watersheds



Source: San Luis Obispo County Integrated Regional Water Management Plan, 2018

Major Sources of Flooding/Problem Areas

Stream flows in the county are seasonal and generally runoff from all streams are minimal. According to the Flood Insurance Study during large storms with heavy rains the stream flows increase rapidly, and floodwaters often contain high volumes of debris that are often the cause of major flood damage. The major causes of riverine flooding in the county are the result of undersized channels with obstructions within them: small bridge opening at several highways, small culverts across local roads, and dense vegetation growth in the channels (FEMA, 2012). In addition to riverine and localized flooding, coastal communities in the county are also at risk of coastal flooding. Refer to the Coastal Storms/Coastal Erosion/Sea Level Rise section for more information on coastal flooding.

Areas of San Luis Obispo County that have been mapped by FEMA as being located within the 100-year floodplain are described below. Incorporated areas of the County that have been mapped by FEMA can be found in the jurisdictional annexes. Figure 5-66 that follows the descriptions show the 100-year and 500-year floodplains and the location of levees in the county:

Arroyo Grande: Areas of potential flooding in response to a 100-year storm are located adjacent to Canyon/Meadow Creek on the west side of the City of Arroyo Grande, adjacent to Corbett Canyon and Arroyo Grande Creeks in the eastern portion of the City, and a limited area along Los Berros Creek, in the southeastern portion of the City. Areas that would be inundated in response to a 100-year flood along these creeks are generally located along stream channels; however, in isolated areas, adjacent properties could be adversely affected. Near the confluence of Corbett Canyon and Arroyo Grande Creek, the 100-year floodplain widens, resulting in impacts to properties. The floodplain along Arroyo Grande Creek also widens slightly on the north and south sides of U.S. 101. Although areas subject to flooding from a 100-year flood are limited, floodwater could cause roadways to become impassable, thereby hindering travel and response efforts. Figure 5-66 depicts areas subject to inundation from a 100-year storm and does not necessarily depict areas that may be affected by local drainage problems. The City has worked to alleviate drainage problems in these areas.

Atascadero: The Salinas River is located in the northeastern and eastern areas of the City of Atascadero. The floodplain of the river is generally removed from the developed areas, however, properties on the east side could be affected by flooding during a 100-year storm. The crossing of Halcon Road over the Salinas River is frequently washed-out in storm events and would be washed-out during a 100-year storm event.

Atascadero Creek extends through the central portion of the City but has a limited potential for flooding impacts as the 100-year floodplain is generally confined to the channel and adjacent properties. Where Atascadero Creek crosses U.S. 101 and State Route 41, a 100-year flood could cause inundation of the portions of the highways. This would have the potential to result in significant local and regional transportation impacts. The area designated as being located within the 500-year floodplain of the Salinas River and Atascadero Creek encompasses approximately 1.5 square miles of the central portion of Atascadero.

In the southeastern portion of Atascadero, flooding hazards could result from 100-year flows in several branches of Paloma Creek. Identified inundation areas are primarily located adjacent to the creek channels, although some more extensive areas could also be affected. In the western portion of the City, flooding along Graves Creek would primarily be restricted to the stream channel.

Figure 5-66 below shows areas subject to inundation from a 100-and 500-year storms and does not necessarily depict areas that may be affected by local drainage problems. Atascadero has historically experienced drainage and related flooding problems in an area known as the Amapoa/Tecorida Basin, which is located to the east of Atascadero Creek and Morro Road, and south of U.S. Highway 101. This area has been subject to building moratoriums and fee programs to pay for drainage improvements. In recognition of this drainage problem, the lower portion of the basin has a Flood Hazard overlay zoning designation.

The Amapoa/Tecorida drainage basin has been prone to flooding for a variety of reasons. The primary cause of flooding in this area is the result of storm events which because water flows in Atascadero Creek, greater than the 17-year design storm, to overtop the Atascadero Lake spillway channel banks and flow into the Amapoa/Tecorida basin.

Other factors that have contributed to inadequate drainage in this area include flat topography and low water velocities increasing run-off volumes due to urban development, undersized drainage culverts and channels, particularly at Highway 101, and the lack of a formal method to maintain existing drainage facilities on private property. A variety of control strategies for correcting the drainage deficiencies of the Amapoa/ Tecorida area has been proposed. These measures include improvements to the Atascadero Lake spillway, construction of a new storm drains along Highway 41, requiring drainage analysis for projects located within the basin that increase building density, and provision of a mechanism to facilitate the maintenance of drainage facilities on private property. Construction of the storm drain along Highway 41 has already begun.

Grover Beach: Isolated areas of potential flooding in response to a 100-year storm are located in the northern and western portions of the City of Grover Beach that are adjacent to Meadow Creek. Flood hazard areas in the northern portion of the City are restricted to an area south of U.S. 101 and north of Nacimiento Avenue. A mobile home subdivision is located in this area.

In the western part of the City, flooding could affect areas located west of the Union Pacific Railroad tracks. Figure 5-66 depicts areas subject to inundation from a 100-year storm and does not necessarily depict areas that may be affected by local drainage problems. Local flooding conditions currently exist in two isolated areas within the City where properties are located below street level.

Morro Bay: Flooding in the City of Morro Bay could occur as a result of flows in Morro Creek, Little Morro Creek, Chorro Creek, and the several smaller creeks located in the northern portion of the City. Flooding from these creeks could potentially render State Highway 1 bridges over these waterways unusable during a major storm.

During the rains of 1995 Highway 1 was closed through Morro Bay due to flooding. Flooding from Chorro Creek would affect the eastern portion of the City. In 1995, flooding from Chorro Creek inundated Twin Bridges (now Chorro Creek Bridge) for several days, forcing travelers from Los Osos to detour through San Luis Obispo in order to reach Morro Bay. The new Chorro Creek Bridge, completed in 1996, was constructed at a higher elevation than Twin Bridges to avoid future closures due to flooding.

The creeks located in the northern portion of the City traverse areas that have been extensively developed with residential uses. In 1995, houses located along Alva Paul Creek, and other houses in north Morro Bay, were flooded. Also, the area between Highway 41 and Radcliffe Street flooded in 1995 causing much

property damage to both residences and businesses. In the isolated areas where the creek floodplains extend beyond the stream channels, flooding impacts could also be significant.

Paso Robles: Several watercourses are located within the City of Paso Robles that have the potential to cause flooding impacts. The Salinas River is the major watercourse located in Paso Robles and runs through the center of the City. Flows in the Salinas River that could result from a 100-year flood are primarily contained in the river channel. On the west side of the City, flooding from Mountain Springs Creek could affect isolated residential areas.

The area located adjacent to and west of U.S. 101 could also be inundated by runoff from a 100-year storm. A 100-year flood event could result in the inundation of areas in the southwestern portion of the City. In the eastern portion of the City, several unnamed creeks have 100-year floodplains that would primarily affect the creek channel and adjacent properties. In the northern portion of the City, Huerhuero Creek could cause isolated areas of flooding along the road that leads to the Paso Robles Municipal Airport.

Pismo Beach: The City of Pismo beach has two areas with potential flood hazards: the Pismo Creek/Price Canyon and Meadow Creek/Pismo Marsh drainage ways. Since major flooding in 1971, the City, with the aid of the Army Corp of Engineers, has made alterations to Pismo Creek channel to reduce flood hazard. Existing floodplain maps prepared prior to the creek improvements show that substantially developed areas in the city's commercial core and Pismo Creek Planning Areas could be subject to flooding from a 100-year storm.

The majority of the Meadow Creek floodplain within the city limits is contained within the State Department of Fish and Wildlife controlled Pismo Lake Ecological Preserve (Pismo Marsh). The preserve is bounded on all sides by slopes which rise over the 100-year level of flood, thus containing flooding within the preserve boundary. Meadow Creek leaves the preserve at State Highway 1 which crosses the creek via a low-lying bridge. The creek flows into the North Beach Campground where it divides into two channels one flowing into the ocean and the other flowing southward into the Grover Beach area. The creek channel floods State Highway 1, the commercial property to the north of the creek at State Highway 1, and the North Beach Campground during periods of heavy storm flows. The level of flooding is affected by tidal conditions.

City of San Luis Obispo: The City of San Luis Obispo is traversed by several creeks, including San Luis Obispo Creek and its major tributaries, Stenner Creek, Brizzolara Creek and Prefumo Creek.

The 100-year floodplains for these creeks encompass extensive areas of the City on the east and west sides of U.S. 101, including the downtown area. Historic flooding on San Luis Obispo Creek, such as the floods of 1969, 1973, and 1995, have resulted in substantial property damage and loss of life. Several areas in the downtown of San Luis Obispo are subject to localized flooding.

Unincorporated Communities

The areas of unincorporated communities that have been mapped by FEMA as being located within the 100-year floodplain are described below.

South Bay: The South Bay area of the County (including the communities of Baywood Park, Los Osos, and Cuesta-by-the Sea) has not been identified as being located within a 100-year storm floodplain by the most recent Flood Insurance Rate Maps (FIRMs). Flooding in response to a 100-year storm is generally

confined to shoreline areas surrounding Morro Bay. There are locations in this area, however, that are subject to chronic localized flooding. After a significant rain, localized flooding occurs throughout the Los Osos area. Numerous intersections within the community experience flooding during storm events.

Cambria: Santa Rosa Creek has a history of flooding which has caused severe erosion of the creek banks as well as damage to phone and gas lines, water wells, and bridges. Major bank erosion in the past has caused complete interruption of the town's water supply. The 100-year floodplain for Santa Rosa Creek is generally confined to the creek channel and surrounding areas south of Main Street. However, the West Village business area along Main Street has been subjected to severe flooding as a result of recent flood levels that overtopped the banks of Santa Rosa Creek. A creek bypass and West Village Storm Drain system constructed in 2009 has significantly reduced, but not eliminated, this potential flood scenario.

Cayucos: The 100-year flood areas near the community of Cayucos are predominately confined to areas adjacent to Cayucos Creek, Little Cayucos Creek, and Willow Creek. Several limited areas of the community along these areas have been designated as being in a 100-year floodplain.

Nipomo: Flooding in the community of Nipomo occurs primarily along Nipomo Creek and its tributaries, such as Deleissiques Creek and Mehlschau Creek. The 100-year and 500-year floodplains along these creeks encompasses areas adjacent to the watercourses, along with extensive areas located east and west of U.S. Highway 101.

Oceano: Flooding in Oceano is a result of heavy flows in Arroyo Grande Creek and Meadow Creek. The most significant inundation area is near the creeks' confluences with the ocean. Areas subject to flooding as a result of a 100-year storm generally extend south of State Highway 1 and west of Halcyon Road. The Arroyo Grande Creek channel has limited storm capacity and has potential of overtopping levees through town. An emergency response plan has been adopted to address potential breach of levees and the wide spreading flooding that may result. Flooding within the town generally occurs at the Oceano County Airport and the Sanitation District Wastewater Plant, along with the residential neighborhoods in low-lying areas around these facilities in particular. This area was subject to the greatest extent of damage in the December 2010 storm.

San Margarita: Yerba Buena Creek, which drains a significant watershed, runs through the community and continues north toward before joining Santa Margarita Creek which empties into the Salinas River. The shadowing effect of Santa Lucia Range to the south of the community tends to limit the amount of rainfall. Localized flooding occurs due to potential creek flows and the flat terrain inhibiting runoff to the creeks.

Templeton: Watercourses located in and near the community of Templeton include the Salinas River and Toad Creek. The 100-year floodplain of the Salinas River as it passes to the east of the community is confined to the river channel and does not significantly affect the town. The floodplain for Toad Creek is not extensive. The 100-year flood along this watercourse would have the potential to affect adjacent properties most notably along Salinas and Eddy Streets and an area between Route 101 and Main Street at the north edge of town.

San Miguel: The community of San Miguel is located west of the Salinas River, and north of the confluence of the Estrella River with the Salinas River. Properties in the 100-year floodplain are primarily located on the lower terrace. Because of the lack of storm drains, low points in the community are sometimes inundated during periods of heavy rainfall. These areas are generally along N Street and

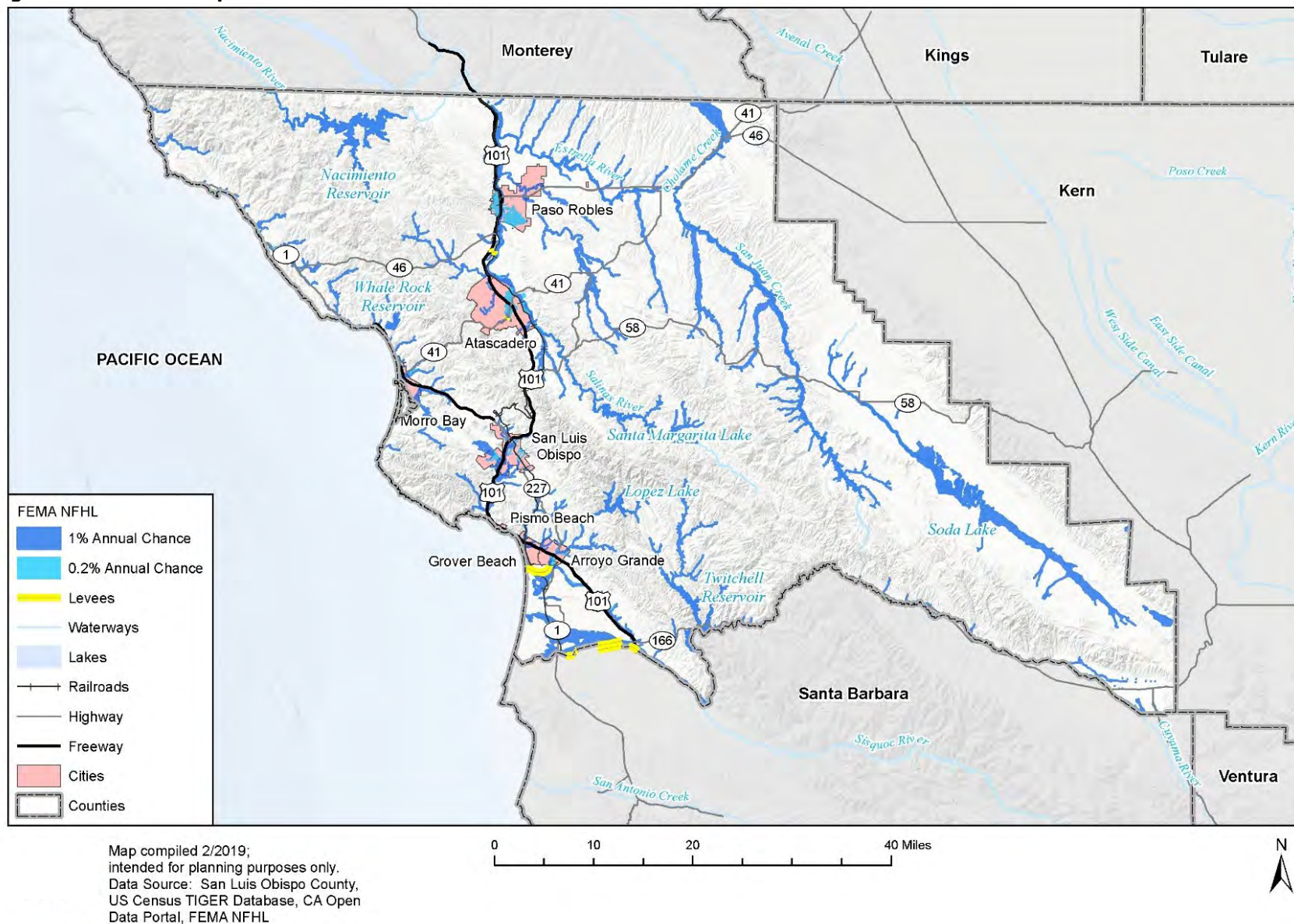
Mission Street between 12th and 16th Streets. A comprehensive drainage study was prepared for San Miguel in 2003 and the associated drainage plan is being implemented incrementally as new development occurs.

Creston: The community of Creston is located between the west and middle branches of Huerhuero Creek. The 100-year floodplains of these creeks are located adjacent to the western and eastern edges of the community and could have the potential to affect adjacent developed properties.

Shandon: The community of Shandon is located southwest of the confluence of San Juan Creek with the Estrella River. The 100-year floodplains of these watercourses are not located within the town of Shandon but are located adjacent to developed areas. These water courses also cross State Routes 41 and 46 near the town. Flooding along these watercourses could have the potential to adversely affect access to and from the community.

Rural Areas: Many other areas in the unincorporated portion of San Luis Obispo County are isolated or residents and travelers in these rural areas of the County may need to take excessively long detours during and after floods due to flood impacts on roads. Road impacts are considered a significant flood impact and potential safety risk. In 1997 after the Logan fire, severe rains took out California Highway 166 and two CHP officers and two civilians died, in addition to property loss.

Figure 5-66 FEMA Special Flood Hazard Zones 100- and 500-Year Events



Flood Control Zones

The San Luis Obispo County Flood Control and Water Conservation District (the District) was founded in 1945 with the purpose “to provide for control, disposition and distribution of flood and storm waters of the district and of streams flowing into the district...”. The District provides general funding to help communities identify flooding problems, recommend solutions, and help implement projects and establishes zones of benefit to fund specific mitigation projects. The District established the following major flood control zones:

Zone 1: Arroyo Grande Creek Channel/Zone 1A: Los Berros Diversion Channel of Arroyo Grande Creek

Within this flood control zone, the District is focused on improving the maintenance of Zone 1/1A flood control facilities and has developed a long-term maintenance plan for the channel (Refer to the section below, Levees of Concern, for more information on flooding concerns related to the failure of the Arroyo Grande Levee System). On July 18, 2006, the District’s Board of Supervisors adopted Resolution No. 2006-245 to provide levy assessments on the parcels within both Zone 1 and 1A. Levy assessments provide \$350,000 in funding annually, which allows for the District to provide substantially enhanced maintenance and operation efforts of the Arroyo Grande and Los Berros Channels within Zone 1/1A.

Zone 3: Arroyo Grande Creek

Zone 3 encompasses the communities within the Five Cities. In Zone 3 the District funds the operations of the Lopez Projects which includes Lopez Lake and Dam, Lopez Terminal Reservoir, Lopez Water Treatment Plan and Distribution System. Zone 3 is a wholesale water supplier to the communities of Arroyo Grande, Avila Beach, Grover Beach, Oceano CSD and Pismo Beach.

Zone 9: Areas encompassing San Luis Obispo Creek and its tributaries

Zone 9 was established in 1973 and provides flood control services for the San Luis Obispo Creek watershed (Coastal watershed). This watershed begins in the foothills of the Santa Lucia Range and flows 18 miles to discharge into the Pacific Ocean at San Luis Bay near Avila Beach. The San Luis Obispo Creek follows closely along the route of State Highway 101. The District notes that the Creek and its tributaries have recurring damaging floods and bank instability that require active channel management.

The Zone 9 Advisory Committee was formed to assist the County Board of Supervisors on policy decisions related to Zone 9, as well as assist in determining the needs, desires and financial capabilities of property owners within Zone 9. The Advisory Committee also provides recommendations on specific flood control projects. In March 2003 the San Luis Obispo Waterway Management Plan was developed and adopted. The Plan consists of three volumes. Volume I provide a detailed hydrology and hydraulic analysis of the watershed and its tributaries, identification of management problems to address flooding, bank instability, habitat protection and enhancement, and a preferred project for implementation. Volumes II provides information on the stream management and maintenance program and identifies an approach to routine maintenance including Best Management Practices. Volume III is the drainage design manual to assist in determining criteria for design of drainage channels, storm drain systems, storm water detention and facilities within Zone 9.

Levee Failure

A levee is a raised area that runs along the banks of a river or canal. Levees reinforce the banks and help prevent flooding. By confining the flow, levees can also increase the speed of the water. Levees can be natural or man-made. A natural levee is formed when sediment settles on the river bank, raising the level of the land around the river. To construct a man-made levee, workers pile dirt or concrete along the river banks, creating an embankment. This embankment is flat at the top, and slopes at an angle down to the water. For added strength, sandbags are sometimes placed over dirt embankments.

Levees provide strong flood protection, but they are not failsafe. Levees are designed to protect against a specific flood level and could be overtopped during severe weather events. Levees reduce, not eliminate, the risk to individuals and structure behind them. A levee system failure or overtopping can create severe flooding and high-water velocities. It's important to remember that no levee provides protection from events for which it was not designed, and proper operation and maintenance are necessary to reduce the probability of failure.

Levees of Concern

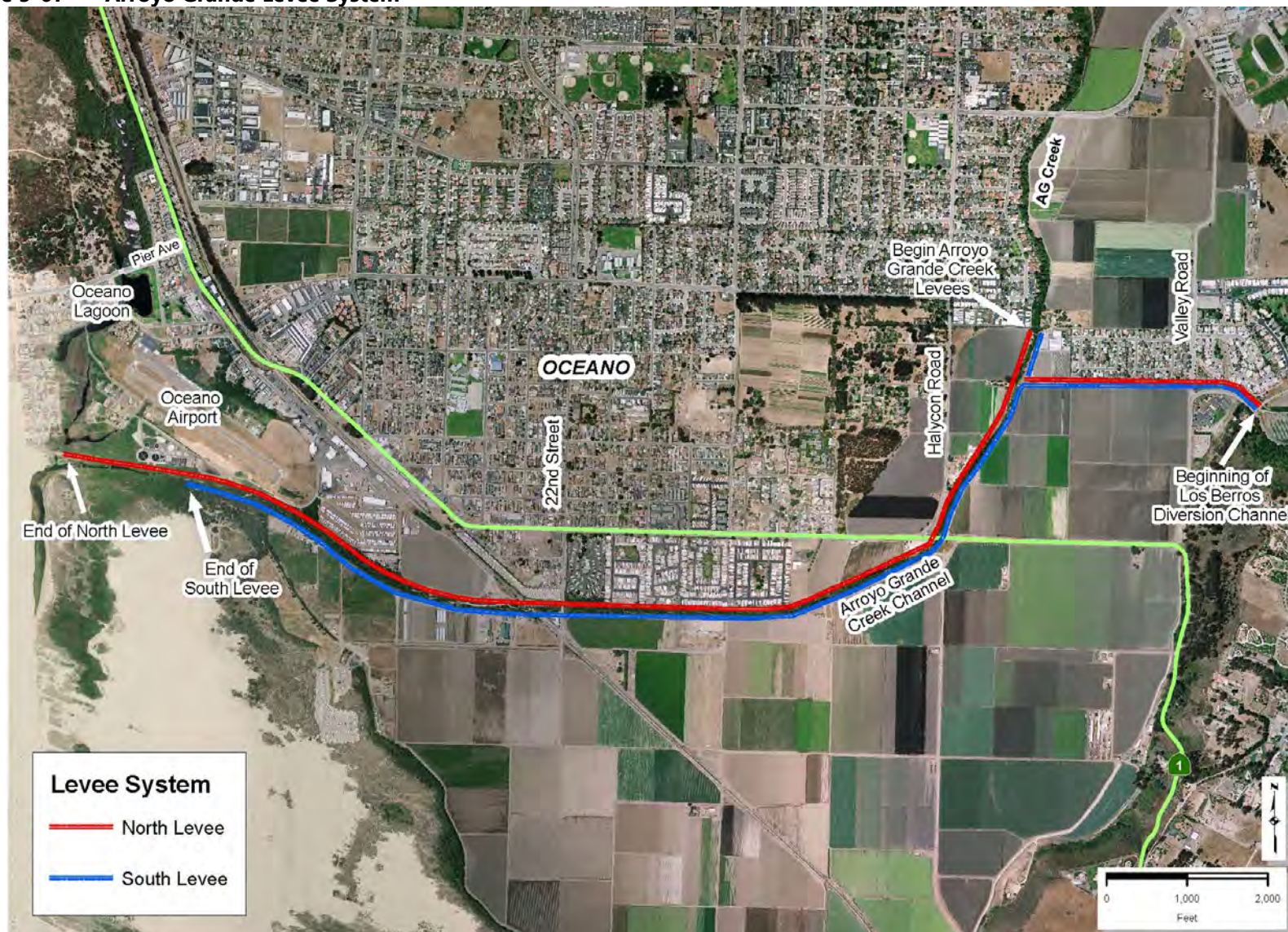
There are two levees of concern that are noted in the County's Dam and Levee Failure Evacuation Plan (2016), the Arroyo Grande Creek levee and Santa Maria River levee. Each is further described below.

Arroyo Grande Creek Levee System

The lower Arroyo Grande Creek, or Cienaga Valley lies at the downstream, lower gradient terminus of a large watershed, causing it to be especially vulnerable to flooding. Severe flooding from the Arroyo Grande Creek in the 1950s resulted in inundation of farmland and had significant impacts on infrastructure. As an outcome of the severe flooding, the community organized the Arroyo Grande Creek Flood Control Project (Project). The main element of the project is a levee system and trapezoidal channel that confined the Arroyo Grande Creek in levees from its confluence with Los Berros Creek downstream to the Pacific Ocean. Runoff from Pismo Lake that travels through Meadow Creek, enters the Arroyo Grande Creek through a pair of flap gates near the Oceano Dunes State Vehicular Recreation Area.

The Project was completed in 1961 and was constructed to convey the design capacity of 7,500 cubic feet per second (cfs) with two-feet of freeboard. The original constructed channel was designed to provide flood protection from a 50-year recurrence interval. Since the completion of the project the channel has lost significant capacity due to challenges to maintain the channel. According to the Arroyo Grande Creek Erosion, Sedimentation, and Flooding Alternative Study (2006) the existing capacity of the channel is estimated to be 2,500 cfs providing flood protection from a storm with only a 4.6-year recurrence interval, or a chance of overtopping every 4.6 years. The Arroyo Grande Creek Levees have experienced failure by high water overtopping in the past. Refer to Previous Occurrences below for further details. Figure 5-67 below depicts the Arroyo Grande Creek Levee system.

Figure 5-67 Arroyo Grande Levee System



Source: San Luis Obispo County Flood Control and Water Conservation District

Santa Maria River Levee

The Santa Maria River Levee was designed and built by the U.S. Army Corps of Engineers (USACE) from 1959 to 1963 and is now owned and operated by the Santa Barbara Department of Public Works' Flood Control District (Dam and Levee Failure Plan, 2016). The San Luis Obispo County's Flood Control District also provides some funding towards the maintenance of the levee as part of the minor flood control for Zone 4. Zone 4 collects service fees from properties in the County of San Luis Obispo that receive flood protection from the levees and reimburses the Santa Barbara District for its maintenance services (San Luis Obispo County Flood Control and Water Conservation District 2009). The levee runs along the Cuyama River, the same river which would be affected by a failure of the high hazard dam, Twitchell Dam, (Refer to the Dam Failure section for information specific to the Twitchell Dam). The Santa Maria River Levee is built of river sand and the portion facing the river is covered with a layer of rock. The levee is not certified by the USACE to withstand a 100-year flood.

Floodplain Mapping

FEMA established standards for floodplain mapping studies as part of the National Flood Insurance Program (NFIP). The NFIP makes flood insurance available to property owners in participating communities adopting FEMA-approved local floodplain studies, maps, and regulations. Floodplain studies that may be approved by FEMA include federally funded studies; studies developed by state, city, and regional public agencies; and technical studies generated by private interests as part of property annexation and land development efforts. Such studies may include entire stream reaches or limited stream sections depending on the nature and scope of a study. A general overview of floodplain mapping is provided in the following paragraphs. Details on the NFIP and mapping specific to participating jurisdictions are in the jurisdictional annexes.

Flood Insurance Study (FIS)

The FIS develops flood-risk data for various areas of a community that is used to establish flood insurance rates and to assist the community in its efforts to promote sound floodplain management. The current San Luis Obispo County FIS is dated November 16, 2012. This study covers both the unincorporated and incorporated areas of the County.

Flood Insurance Rate Map (FIRM)

The FIRM is designed for flood insurance and floodplain management applications. For flood insurance, the FIRM designates flood insurance rate zones to assign premium rates for flood insurance policies. For floodplain management, the FIRM delineates 100- and 500-year floodplains, floodways, and the locations of selected cross sections used in the hydraulic analysis and local floodplain regulation.

According to the HMPC, FEMA Region IX is currently conducting survey and field reconnaissance through October 2019, in four study areas in the County; (1) an area of the Salinas River north of the City of Paso Robles; (2) An area of the Huerhuero Creek; (3) areas of the San Luis Obispo Creek in the southern part of the City of San Luis Obispo and in the Avila Beach area; (4) an area of Meadow Creek through the cities of Pismo Beach and Grover Beach. Following the survey and field, FEMA Region IX will perform hydrology and hydraulics analysis and develop floodplain mapping, flood risk products and work maps by May 2020.

Extent (Magnitude/Severity)

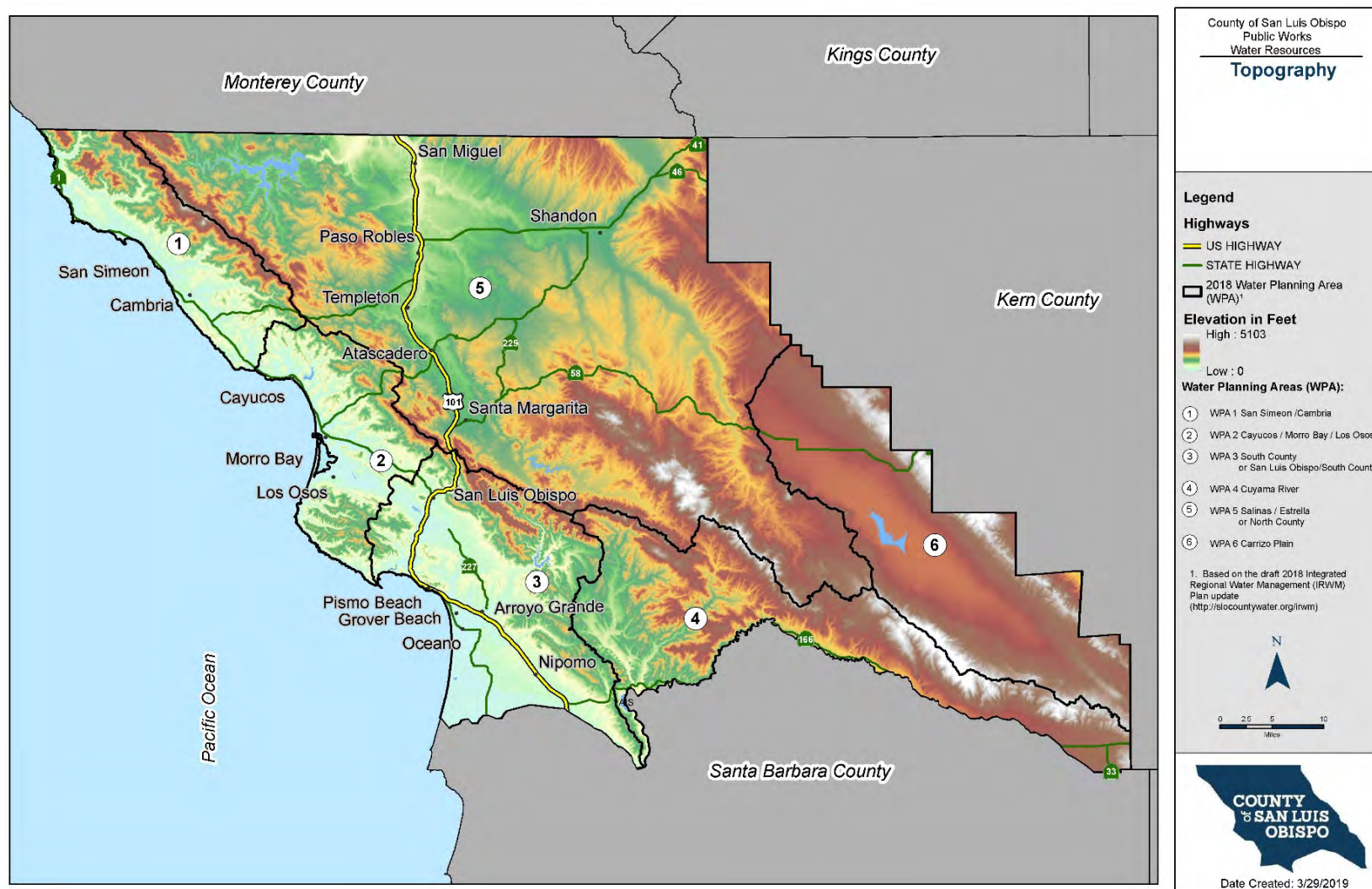
San Luis Obispo County is large and is characterized by its extremely diverse terrain. This varying and diverse terrain when viewed in combination with flood maps can be an indicator of flood extent. Together, coastal terrain and narrow valleys, flood depth, and velocity affect the extent of flood hazards and resulting damage in the County. Deeper and faster flood flows can damage communities in the County. However, shallow flooding with higher flows can cause similar damage.

The Santa Lucia Mountain Range, which curves from the northwest to the southeast to form a barrier between the coast and interior areas; leading to more precipitation on the coast compared to the interior areas (Refer to the Adverse Weather section for more information on differences in precipitation throughout the county). The coastal plain in the North Coast Area from Morro Bay to Cambria in the north, consists of a narrow beach that backs up to the Santa Lucia Range and is cut by a number of stream valleys that empty into the Pacific Ocean. The southern coastal plain area between Arroyo Grande and Morro Bay is characterized by valley and mountain ridges. The lower reaches of the valleys are formed by broad alluvial plains that open to the ocean. While the upper reaches of the valleys are narrow and end in steep mountain canyons.

During the winter and spring months the County experiences heavy rain events that cause high runoff into the river systems. Issues arise when the runoff carries debris and sediment that overwhelm the County's drainage infrastructure. To prevent flooding, a wide variety of storm drainage and flood control measures are used throughout the County to prevent issues with high runoff. These include flood control reservoirs, levee systems, and watershed treatments. In developed areas, storm drainage systems composed of street gutters, inlets, underground storm drains, ponds, pumping stations, and open channels are used to collect and control stormwater runoff. The storm drainage and flood control systems are discussed further in the sections that follow.

Figure 5-64 illustrates major natural and manmade waterways in the county. The map that follows, Figure 5-68 depicts the diverse topography of the county.

Figure 5-68 San Luis Obispo County Topography



Source: San Luis Obispo County Public Works, Water Resources Division

Levee Failure Extent

The magnitude and severity of the levees of concern for the County (Santa Maria and the Arroyo Grande Levees) as described in the 2016 Dam and Levee Evacuation Plan are as follows,

Arroyo Grande Creek Levee System

Under the current conditions of this levee system (refer to Levees of Concern) the county estimates the channel will likely overtop the south levee between State Highway 1 and the 22nd Street bridges (Dam and Levee Failure Evacuation Plan, 2016). The threat of flooding related to the Arroyo Grande Creek levee failing will be confined to areas immediately adjacent to levees as well as the potential for damage in low-lying areas less than 50-feet above mean sea level and are immediately adjacent to the Arroyo Grande Creek levees. According to the County's Evacuation Plan for dam and levee failure, critical facilities of concern of failure of the Arroyo Grande Creek Levee include the South County Sanitation District's waste water treatment plan and the Oceano Airport; both of which are located adjacent to the north levee of the channel between the mouth of the Arroyo Grande Creek and the Union Pacific railroad bridge (Dam and Levee Failure Evacuation Plan, 2016). The County expects flooding due to levee overtopping or breaching to damage roadways, communication systems and infrastructure, with the areas most at-risk of the Arroyo Grande Creek Levee system failing being those adjacent to the channel and within in the 100-year floodplain.

Santa Maria River Levee

The USACE reviewed inspected the Santa Maria River Levee in 2006 as part of a systematic assessment of flood control structure and facilities in the United States following the events of Hurricane Katrina. In March 2006, after inspecting the Santa Maria River Levee the USACE placed the levee on the national list of levees at risk of failure and denied certification that the levee could withstand a 100-year flood event. The Santa Maria River Levee will be affected by a failure of the Twitchell Dam. The community that will most likely be impacted is the City of Santa Maria which borders the County of San Luis Obispo and is located in Santa Barbara County. The Santa Barbara Flood Control District is responsible for the levee.

Previous Occurrences

San Luis Obispo County has experienced severe flooding events that have resulted in extensive property damage. Flooding hazards are most likely to exist along major river and stream courses including the Salinas River, San Luis Obispo Creek, Santa Rosa Creek, Arroyo Grande Creek, Morro Creek and Huerhuero Creek. Areas that have been recently affected by flooding impacts are the areas most to be likely to be affected by future events. Therefore, a historical perspective of the effects of recent flood events can provide useful insight in land use planning and reduction of future flood hazard risks.

The following table contains a list of previous flooding events throughout the County over the past fifty years.

Table 5-81 Major Floods in San Luis Obispo County

Date of Event	Incident Description
January-February 1969	A series of storms delivered 12-21 inches of rainfall over an 8-day period. In February, another storm brought over 5 inches of rain. The most severe damage to urban property occurred in the City of San Luis Obispo, where San Luis Obispo Creek channel filled with debris and flow over-topped the channel banks and onto the city streets. Severe damages were sustained by streets, highways, and utilities through-out the County. In Cambria, the water-supply system was damaged. The sewage-treatment plants at Morro Bay, Avila Beach, and Pismo Beach were inundated by both floods.
January, 1973	Unusually heavy rainfall occurred over a 10-hour period. San Luis Obispo Creek, and its tributary, Stenner Creek, overtopped their banks and inundated a wide area of downtown City of San Luis Obispo.
February 22, 1993	This flash flood occurred in a 2-hour period causing \$500,000 damage to four businesses and several residences. 2.5 inches of rain in total were reported.
January and March, 1995	Serious flooding occurred in all coastal and many inland streams. Extensive damaged occurred in the City of San Luis Obispo and the San Luis Obispo Golf Course. Cambria had up to 6 feet of water in areas.
February 2, 1998	Heavy rain drenched the entire area causing an average of rainfall totals that ranged from 2 to 8 inches over coastal areas, up to 12 inches in the mountains. Widespread flooding was reported in all areas. Forty homes were flooded in Solvang and 15 homes were flooded in Ojai. Flooding and mudslides closed parts of most major roadways across the area including State Highways 1, 33, 101, 118, 126, 150, 154, 166 and the 246. Refer to the Adverse Weather Past Events tables for more information on the rain, and wind hazards that were associated with this event.
November 28, 1998	Moderate rain produced local street flooding in several Central Coast communities including Santa Maria, Lompoc and Pismo Beach.
May 5, 1998	Heavy rain produced flash flooding and mudslides across Southern San Luis Obispo County and closed portions of State Highway 166. Rainfall totals ranged from 1 to 3 inches over coastal areas, up to 6 inches in the mountains. Numerous flooding problems were reported across the area.
January 31, 1999	Urban flooding, along Los Osos road, was reported in the City of San Luis Obispo.
January 8, 2001	Heavy rain produced street flooding in the city of Pismo Beach.
January 11, 2001	An extremely large swell combined with high astronomical tides produced heavy surf and flooding of coastal areas along Central and Southern California.
March 4-5, 2001	Heavy rain produced numerous flooding. In Oceano, the Arroyo Grande Creek overflowed, destroying numerous crops and damaging one home. Also, the Pacific Dunes RV Park was flooded, stranding several residents. In Arroyo Grande, flooding along Corbett Creek damaged four homes and five classrooms in Arroyo Grande High School. In Pismo Beach, flooding along Pismo Creek damaged some homes in Pismo Court Village. In Nipomo, several small streams flooded, damaging 20 to 30 homes. In Creston, the heavy rain produced widespread urban flooding.
December 30, 2004	The heavy rain resulted in numerous reports of urban and rural flooding. In Lopez Canyon near Paso Robles, a 62-year-old man was swept down a flooded creek. Refer to the Adverse Weather section for details on heavy rain amounts related to this event.

Date of Event	Incident Description
Late December of 2005 and early January 2006	In late December of 2005 and early January 2006, a series of storms battered the County. Most of the damage occurred New Year's Eve and New Year's Day. High winds and saturated soils resulted in significant tree falls particularly in the Cambria area where heavy damage was reported to a number of homes and businesses. There was one fatality which was a result of a tree falling on a pick-up truck while it was traveling on U.S. Highway 101 in the Paso Robles area. Damage estimates for both private property loss and the loss and cost to local governments totaled approximately \$3,000,000.
November 21, 2010	An early season storm dropped down across Central and Southern California, bringing heavy rain and flash flooding. The storm produced two impulses of rainfall between November 19th and 21st. The heaviest rainfall occurred across San Luis Obispo, Santa Barbara and Ventura Counties with rainfall totals ranging from 0.50 to 1.50 inches across coastal areas to between 1.50 and 4.00 inches in the foothills and mountains. California Highway Patrol reported flash flooding in southern San Luis Obispo County. Due to heavy rain, the roadway was completely washed away at the intersection of State Highway 1 and Division Street.
December 19, 2010	A series of and slow-moving storms brought heavy rain, strong winds and light snow to the area. The most severe damages began on December 19, with primarily affected areas in the South County, particularly in the Oceano area. Damages reported to Cal EMA were just over \$2,000,000 in private property losses and an estimated cost and loss total to local governments of just over \$1,100,000 for a total storm damage cost estimate of approximately \$3,135,000.
June 10, 2015	The combination of remnant moisture from Hurricane Blanca and an upper level low pressure system off the Central California coast brought strong thunderstorms to interior sections of San Luis Obispo and Santa Barbara counties. Flash flooding and mud/debris flows were reported just east of the community of Cuyama. California Highway Patrol reported flash flooding at the intersection of Highway 33 and Highway 166.
May 6, 2016	A moist and unstable atmosphere generated thunderstorms and flash flooding across inland sections of Santa Barbara and San Luis Obispo counties. Due to flash flooding and mud and debris flows, sections of State Highways 46 and 166 were closed. California Highway Patrol reported flash flooding and mud and debris flows across sections of Highway 46, northeast of Shandon.

Source: NCEI Storm Events Database, 2014 SLO County LHMP

More recently severe winter storms occurred during February and March 2019 in San Luis Obispo County. Atmospheric rivers brought heavy amounts of precipitation to the Central Coast region causing the Salinas River, one of the largest rivers in the County, to flood multiple times. In February, a woman was rescued from the flooded Salinas River in Paso Robles by the Paso Robles Fire Department. She was transported to the hospital and was expected to recover from the incident (KEYT, 2019). In March, after heavy rains the Salinas River's water raised quickly causing the river to flood once more. In Atascadero south of the Highway 41 bridge, five people, five dogs and one cat were rescued from the Salinas River after they were stranded on an island in the middle of the river. The group was rescued by Atascadero Fire and Emergency Services using swift water rescue equipment to wade through the high water and bring the people and animals back to the shore safely. No injuries were reported (Atascadero News, 2019).



Levee Failures

The following levee failure event was noted in the 2016 San Luis Obispo County Dam and Levee Failure Evacuation Plan:

In March 2001 following a heavy rain event, the Arroyo Grande levee system was breached on the south side between the mouth of the Arroyo Grande Creek and the Union Pacific railroad bridge. Hundreds of acres of farmland in the Cienega Valley as well as several residences were flooded. Impacts from the levee failure and resulting flooding lasted beyond the winter months due to the clay soils in the southern portion of the valley that remained saturated for months later. The northern levee did not fail and was able to protect several residential developments, and the regional wastewater treatment plant that serves Arroyo Grande, Oceano, and Grover Beach. Failure of the north levee of the Arroyo Grande levee systems would be a significant risk to property and human lives. The following figure, taken from the Arroyo Grande Creek Channel Waterway Management Program Final Report, 2010, are pictures of the levee failure event.

Figure 5-69 Arroyo Grande Levee Failure Event, March 2001 (Looking South)



Source San Luis Obispo County OES , taken during storm damage assessment, March 2001

Figure 5-70 Image of Past Flooding in San Luis Obispo County



Figure 5-71 Image of Past Flooding in San Luis Obispo County



Figure 5-72 Image of Past Flooding in San Luis Obispo County



Probability of Future Occurrences

100-Year Flood

Likely—The 100-year flood is the flood that has a one percent chance in any given year of being equaled or exceeded.

<100-Year Flood/Outside the 100-Year Floodplain

Highly Likely—Based on historical data, flooding events less severe than a 100-year flood and those outside of the 100-year floodplain occur frequently during periods of heavy rains.

Climate Change Considerations

There are two types of flooding that will be exacerbated by climate change, coastal flooding related to sea level rise and inland flooding due to the projected increase in the precipitation which may also lead to levee or dam failure due to overtopping. The discussion in this section focuses on inland flooding. Refer to the Coastal Storms/Coastal Erosion/Sea Level Rise section for climate change considerations related to coastal flooding.

California's Fourth Climate Assessment found that costs associated with direct climate change impacts by 2050 will be dominated by human mortality, coastal damage, and the potential for droughts and mega-floods (California Natural Resources Agency 2018). Scientific studies outlined in the same assessment also indicated shifts in California's precipitation regime, which show more dry days, more dry years, a longer dry season, and increases in occasional heavy precipitation events and floods. Studies also project great storm intensity with climate change, resulting in more direct runoff and flooding (California Natural Resources Agency 2018). As a result, high frequency flood events in conjunction with heavy precipitation events and extreme storm events will increase with climate change. Certain climate studies noted in the Fourth Climate Assessment also forecast that during periods with heavy rain and frequent storm events

there is an increase in flood events, as well as landslide and debris flow (California Natural Resources Agency 2018). For example, during the 2016-2017 winter, the storms resulted in many secondary hazards, including numerous landslides and in some watersheds an increased sediment load. Also, with wildfires already being a problem in California, increasing periods of drought and lack of precipitation are expected to exacerbate conditions for fires to occur, and in turn worsen the potential for runoff and flooding associated with burned areas.

The Fourth Climate Assessment also includes nine reports for the nine regions in California. According to the Central Coast Summary Report projected flooding over the next century, including erosion and cliff retreat hazards will threaten many Central Coast communities (California Natural Resource Agency 2018b). The report notes that the Coastal Storm Modeling System (CosMoS), which is a modelling approach to comprehensively assess the physical and socioeconomic impacts of climate changes, will have projections for the entire central coast region by early 2019 (California Natural Resources Agency 2018a). Currently, the mapping has been completed for all of Southern California, including Santa Barbara County from Ventura County up to Point Conception. Refer to the Coastal Storms/Coastal Erosion/Sea Level Rise section for more information related to climate change effects for San Luis Obispo County.

Vulnerability

While there are some benefits associated with flooding, such as the replenishment of beach sand, and nutrients to agricultural lands, it is considered a hazard to development in floodplains. Floods can cause many cascading effects. Fire can break out as a result of dysfunctional electrical equipment. Hazardous materials can also get into floodways, causing health concerns and polluted water supplies. In many instances during a flood, the drinking water supply will be contaminated. During the 2019 update the following vulnerability analysis using GIS was performed.

General Property

Historically, San Luis Obispo County has been at risk to flooding primarily during the winter and spring months when river systems in the county swell with heavy rainfall. Normally, storm floodwaters are kept within defined limits by a variety of storm drainage and flood control measures. But occasionally, extended heavy rains result in floodwaters that exceed normal high-water boundaries and cause damage. Flooding has occurred in the past within the 100-year floodplain and in other localized areas.

Methodology

A flood vulnerability assessment was performed for San Luis Obispo County using the following GIS methodology. The County's parcel layer and associated assessor's building improvement valuation data were provided by the County and were used as the basis for the inventory. San Luis Obispo County's effective Digital Flood Insurance Rate Map (DFIRM) was used as the hazard layer. A DFIRM is FEMA's flood risk data that depicts the 1% annual chance (100-year) and the 0.2% annual chance (500-year) flood events; this data is incorporated into the National Flood Hazard Layer (NFHL). San Luis Obispo County's effective FEMA DFIRM, dated May 16, 2017, was determined to be the best available floodplain data. Table 5-82 summarizes the flood zones included on these maps. Note, while this Plan was in the process of being written, the county was also in the process of updating their flood insurance maps.

GIS was used to intersect the parcel boundaries with a master address point layer to obtain number of buildings per parcel. The parcel layer was then converted into a centroid, or point, representing the center of each parcel polygon.

Only parcels with improvement values greater than zero and center points were used in the analysis, this method assumes that improved parcels have a structure of some type. The DFIRM flood zones were overlaid in GIS on the address points and parcel centroid data to identify structures that would likely be inundated during a 1% annual chance and 0.2% annual chance flood event. This overlay can be seen graphically in the regional maps in Figure 5-73, and in more detail in the jurisdictional annexes.

Figure 5-73 San Luis Obispo County Parcels in Flood Zones

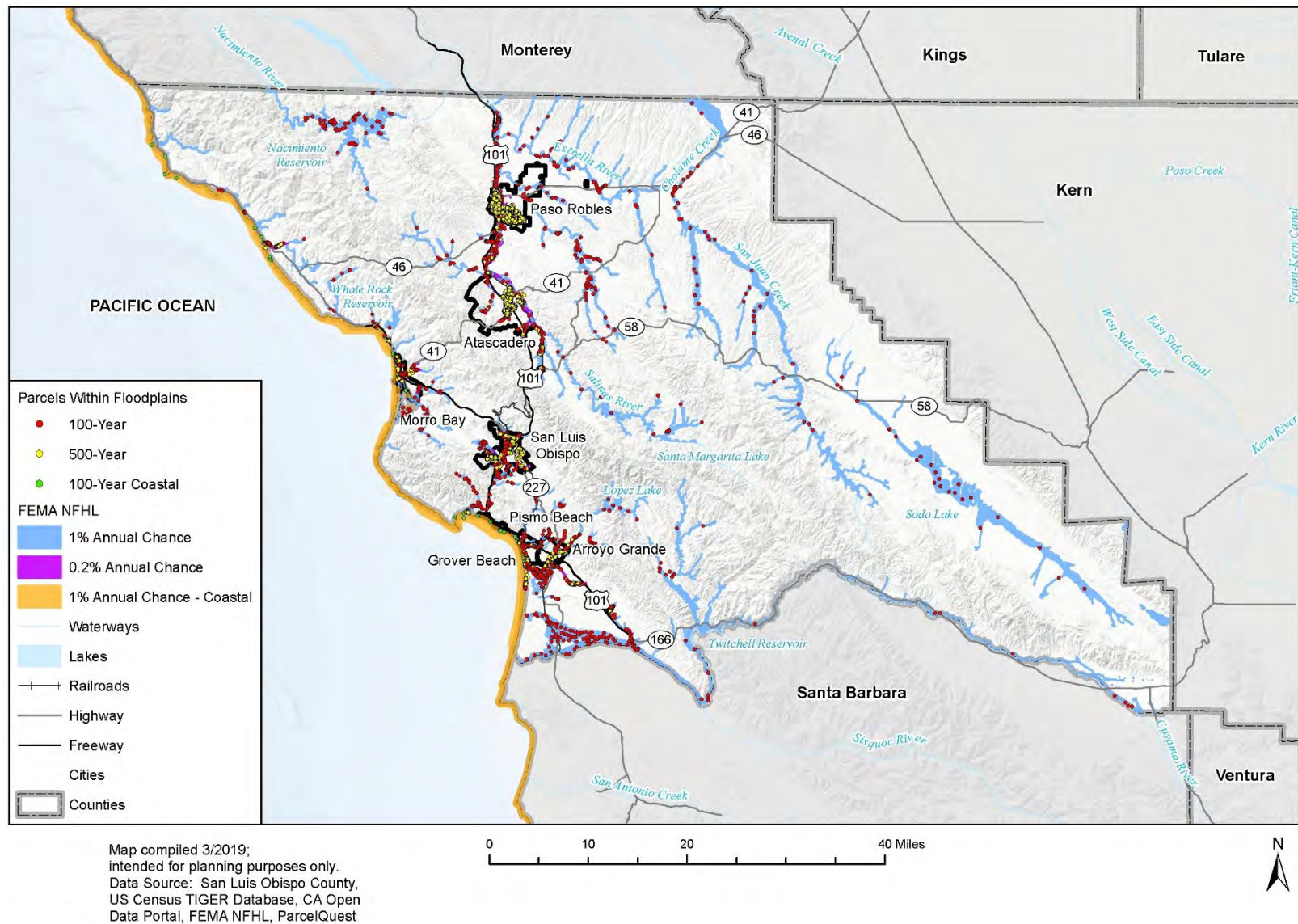


Table 5-82 San Luis Obispo County's Flood Zones

Flood Zone	Definition
Special Flood Hazard Areas (SFHA) Subject to Inundation by 100-Year Flood	
Zone A	No base flood elevations determined
Zone AE	Base flood elevations determined
Zone AH	Flood depths of 1-3 feet (usually areas of ponding); base flood elevations determined
Zone AO	Flood depths of 1-3 feet (usually sheet flow on sloping terrain); average depths determined; for areas of alluvial fan flooding, velocities also determined
Zone AR	SFHA formerly protected from the 1 percent annual chance flood by a flood control system that was subsequently decertified; zone AR indicates that the former flood control system is being restored to provide protection from the 1 percent annual chance or greater flood
Zone A99	Area to be protected from 1 percent annual chance flood by a federal flood protection system under construction; no base flood elevations determined
Zone VE	Area where waves and fast-moving water can cause extensive damage during the base flood event. Wave heights are larger than 3 feet. A detailed study has been done and BFEs have been calculated.
Other Flood Areas	
Zone X (with color coding)	Areas of 0.2 percent annual chance flood (i.e., 500-year flood); areas of 1 percent annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1 percent annual chance flood
Other Areas	
Zone X (with no shading)	Areas determined to be outside the 0.2 percent annual chance floodplain
Zone D	Areas in which flood hazards are undetermined, but possible

Source: FEMA

Building improvement values and counts for those points were then extracted from the parcel/assessor's data and summed for the unincorporated county and jurisdictions. Results of the overlay analysis area shown in Table 5-83 for the 1% annual chance flood and Table 5-84 for 0.2% annual chance flood. The jurisdictional annexes and Appendix E provide more detailed information based on property type. Property type refers to the land use of the parcel and includes agricultural, commercial, exempt, industrial, multi-residential, open space and residential.

A loss estimate analysis was also performed based on depth damage functions developed by the Army Corp of Engineers and applied in FEMA's BCA software. The loss curves depict the expected flood losses associated with the depth of flooding at a structure. Contents values were estimated as a percentage of building value based on their occupancy type, using FEMA/HAZUS estimated content replacement values. This includes 100% of the structure value for agricultural, commercial, exempt, and open space structures, 50% for multi-residential and residential structures and 150% for industrial structures. Building and contents values were totaled to obtain total exposure.

There are different curves for structure and content losses. For the purposes of this planning level analysis, an average flood depth of 2 feet is assumed. A depth damage ratio of 25% was used for structural loss,

based on the FEMA damage curves for a 2-foot flood. The results are shown in the loss estimate columns in Table 5-83 for the 1% annual chance flood and Table 5-84 for the 0.2% annual chance flood.

It is important to note that there could be more than one structure or building on an improved parcel (i.e., a condo complex occupies one parcel but might have several structures). The end result is an inventory of the number and types of improved parcels subject to flooding. Results are presented by unincorporated county and incorporated jurisdictions. Detailed tables show counts of parcels by jurisdictions and land use type (agricultural, commercial, exempt, industrial, multi-residential, open space and residential) within each flood zone. This flood loss analysis does not account for business disruption, emergency services, environmental damages, or displacement costs, thus actual losses could exceed the estimate shown. Conversely, this analysis does not differentiate parcels that may have been developed since when the county and cities adopted floodplain regulations, which would be mitigated to the 1% annual chance flood if developed in accordance with regulations.

Table 5-83 Count and Improved Value of Parcels in 1% Annual Chance Floodplain by Jurisdiction

Jurisdiction	Parcel Count	Improved Value	Content Value	Total Value	Loss Estimate	% of Total Loss
Arroyo Grande	196	\$31,048,627	\$15,699,806	\$46,748,433	\$11,687,108	3%
Atascadero	140	\$22,999,680	\$14,166,934	\$37,166,614	\$9,291,654	2%
City of San Luis Obispo	1,005	\$526,573,627	\$404,698,319	\$931,271,946	\$232,817,987	54%
Grover Beach	33	\$2,767,614	\$1,759,398	\$4,527,012	\$1,131,753	0.3%
Morro Bay	180	\$35,416,008	\$19,122,601	\$54,538,609	\$13,634,652	3%
Paso Robles	126	\$45,898,934	\$22,691,477	\$68,590,411	\$17,147,603	4%
Pismo Beach	112	\$39,948,474	\$18,243,435	\$58,191,909	\$14,547,977	3%
Unincorporated	1,655	\$341,104,689	\$168,881,222	\$509,985,911	\$127,496,478	30%
Total	3,447	\$1,045,757,653	\$665,263,190	\$1,711,020,843	\$427,755,211	100%

Source: San Luis Obispo County's Assessor's Office; U.S. Census Bureau 2013-2017 estimates; National Flood Hazard Layer Effective date 05/16/2017, FEMA; GIS analysis

All of San Luis Obispo County is at risk of being inundated by a 100-year flood event. The City of San Luis Obispo and unincorporated areas of the County are predominantly inundated by the 100-year floodplain and have the greatest percentages of total loss from a 100-year flood event., with 54% and 30% of the total potential loss respectively. While other jurisdictions are far less at risk during in a 100-year flood event, several jurisdictions including Paso Robles and Atascadero are at a greater risk of inundation in the event of a 500-year flood. While other coastal communities such as, Pismo Beach and Morro Bay may be more at risk of coastal flooding and coastal storms, refer to Coastal Storms/Coastal Erosion/Sea Level Rise section for details. Further discussion on the property types within the 100-year floodplain in the unincorporated areas can be found below. For specific analysis for each jurisdiction refer to the jurisdictional annexes and Appendix E.



Table 5-84 Count and Improved Value of Parcels in 0.2% Annual Chance Floodplain by Jurisdiction

Jurisdiction	Parcel Count	Improved Value	Content Value	Total Value	Loss Estimate	% of Total Loss
Arroyo Grande	477	\$89,177,181	\$45,013,619	\$134,190,800	\$33,547,700	3%
Atascadero	2,807	\$510,278,898	\$287,391,336	\$797,670,234	\$199,417,558	20%
City of San Luis Obispo	1,475	\$387,010,950	\$221,600,543	\$608,611,493	\$152,152,873	15%
Grover Beach	4	\$315,959	\$58,171	\$374,130	\$93,532	0.01%
Morro Bay	264	\$40,352,614	\$20,050,949	\$60,403,563	\$15,100,891	2%
Paso Robles	5,775	\$1,244,000,280	\$738,857,892	\$1,982,858,172	\$495,714,543	50%
Pismo Beach	83	\$13,858,571	\$6,923,041	\$20,781,612	\$5,195,403	1%
Unincorporated	996	\$214,740,756	\$108,866,662	\$323,607,418	\$80,901,854	8%
TOTAL	11,881	\$2,499,735,209	\$1,428,762,211	\$3,928,497,420	\$982,124,355	100%

Source: San Luis Obispo County's Assessor's Office; U.S. Census Bureau 2013-2017 estimates; National Flood Hazard Layer Effective date 05/16/2017, FEMA; Wood GIS analysis

The percentage of total loss increases for all jurisdictions in a 500-year flood event. Paso Robles and Atascadero have the greatest increases of parcels being at risk of inundation in a 500-year flood. It should be noted that during 500-year flood event properties in the tables represent only those in a 0.2% Annual Chance flood hazard zone. A 500-year flood total loss would include the 100-year floodplain losses noted in Table 5-83 in addition to those located in the 500-year floodplain, as summarized in the table below.

Table 5-85 San Luis Obispo County Flood Loss Estimates

Flood Hazard	Parcel Count	Improved Value	Content Value	Total Value	Loss Estimate
1% Annual Chance	3,447	\$1,045,757,653	\$665,263,190	\$1,711,020,843	\$421,996,605
0.2% Annual Chance	11,881	\$2,499,735,209	\$1,428,762,211	\$3,928,497,420	\$982,124,355
Total	15,328	\$3,545,492,862	\$2,094,025,401	\$5,639,518,263	\$1,404,120,960

Source: San Luis Obispo County's Assessor's Office; U.S. Census Bureau 2013-2017 estimates; National Flood Hazard Layer Effective date 05/16/2017, FEMA; Wood GIS analysis

Based on this analysis, the San Luis Obispo County planning area has 3,447 parcels valued over \$1 million in the 100-year floodplain. An additional 11,881 parcels valued at roughly \$2.5 million fall within the 500-year floodplain. As a result, total structural exposure is approximately \$3.5 billion. When factoring the content values within these areas in addition to the structures the total combined value of exposure is \$5.6 billion.

Table 5-86 and Table 5-87 below provides a detailed analysis that show the count and improved value of parcels that fall in a floodplain by property type for the 100- and 500-year annual chance flood zones. Additionally, these tables include information on loss estimates by flood based on guidance from FEMA. Based on this guidance, contents value is estimated at 50 percent of the improved value. Estimated losses assume that a flood is unlikely to cause complete destruction. Losses are related to a variety of factors, including flood depth, flood velocity, building type, and construction. Using FEMA's recommendations,



average damage is estimated to be 25 percent of the total building value. Refer to the annexes for these results specific to each jurisdiction.

While there are several limitations to this model, it does allow for potential loss estimation. It should be noted that the model may have included structures in the floodplains that are elevated at or above the level of the base-flood elevation, which will likely mitigate flood damage. Also, it is important to remember that the assessed values are well below the actual market values. Thus, the actual value of assets at risk may be significantly higher than those included herein. Also, government/utilities properties are exempt and do not have improved values, thus undercounting the value of these property types.

Table 5-86 Count and Improved Value of Parcels in 1% Annual Chance Floodplain by Property Type

Property Type	Parcel Count	Improved Value	Content Value	Total Value	Loss Estimate	% of Total Loss
Agricultural	89	\$11,350,404	\$11,350,404	\$22,700,808	\$5,675,202	1%
Commercial	478	\$367,413,965	\$367,413,965	\$734,827,930	\$183,706,983	43%
Government/Utilities	301	\$253,272	--	\$253,272	\$63,318	0.01%
Other/Exempt/Misc.	315	\$61,003,405	--	\$61,003,405	\$15,250,851	4%
Residential	1,467	\$324,838,073	\$162,419,037	\$487,257,110	\$121,814,277	28%
Multi-Family Residential	449	\$124,729,271	\$62,364,636	\$187,093,907	\$46,773,477	11%
Mobile/Manufactured Homes	116	\$34,823,625	\$17,411,813	\$52,235,438	\$13,058,859	3%
Residential: Other	82	\$64,200,376	\$32,100,188	\$96,300,564	\$24,075,141	6%
Industrial	19	\$8,135,432	\$12,203,148	\$20,338,580	\$5,084,645	1%
Vacant	131	\$49,009,830	--	\$49,009,830	\$12,252,458	3%
TOTAL	3,447	\$1,045,757,653	\$665,263,190	\$1,711,020,843	\$427,755,211	100%

Source: Wood GIS analysis on San Luis Obispo County's Assessor's Office/Parcel Quest data and FEMA NFHL



Table 5-87 Count and Improved Value of Parcels in 0.2% Annual Chance Floodplain by Property Type – Unincorporated San Luis Obispo

Property Type	Parcel Count	Improved Value	Content Value	Total Value	Loss Estimate	% of Total Loss
Agricultural	8	\$5,755,995	\$5,755,995	\$11,511,990	\$2,877,998	0.3%
Commercial	978	\$390,185,344	\$390,185,344	\$780,370,688	\$195,092,672	20%
Government/Utilities	215	\$1,569,153	--	\$1,569,153	\$392,288	0.04%
Other/Exempt/Misc.	400	\$110,801,439	--	\$110,801,439	\$27,700,360	3%
Residential	7,865	\$1,336,764,814	\$668,382,407	\$2,005,147,221	\$501,286,805	51%
Multi-Family Residential	1,614	\$372,095,045	\$186,047,523	\$558,142,568	\$139,535,642	14%
Mobile/Manufactured Homes	288	\$35,754,816	\$17,877,408	\$53,632,224	\$13,408,056	1%
Residential: Other	358	\$174,333,507	\$87,166,754	\$261,500,261	\$65,375,065	7%
Industrial	50	\$48,897,854	\$73,346,781	\$122,244,635	\$30,561,159	3%
Vacant	105	\$23,577,242	--	\$23,577,242	\$5,894,311	1%
TOTAL	11,881	\$2,499,735,209	\$1,428,762,211	\$3,928,497,420	\$982,124,355	100%

Source: Wood GIS analysis on San Luis Obispo County's Assessor's Office/Parcel Quest data and FEMA NFHL

Insurance Coverage, Claims Paid, and Repetitive Losses

Unincorporated San Luis Obispo County joined the National Flood Insurance Program (NFIP) in 1975. The County currently does not participate in the Community Rating System (CRS), although the City of San Luis Obispo and the City of Morro Bay are both CRS participants. Refer to those jurisdictional annexes for additional information.

In the unincorporated County, there are 902 policies in force, of which there are 716 single family units, 34 2-4 family, 75 all other residential, and 77 nonresidential. There are 406 policies located in an A zone (256 in zone A01-30 & AE, 97 in zone A, 50 in AO, 3 AH). There are 2 policies located in zone V01-30 & VE zones. While the remaining 494 policies are split between standard B, C, & X zone (65) and preferred B, C, & X Zone (429). 420 policies are pre-FIRM, leaving 482 as post-FIRM structures.

NFIP data indicates that there are 2,247 insurance policies in San Luis Obispo County representing \$629,236,900 million of insurance coverage in force. Since 1978 there have been 342 paid losses, totaling \$4,587,019 million. Table 5-88 provides more details on flood insurance policies for each individual jurisdiction.

Repetitive Loss Properties

FEMA insures properties against flooding losses through the NFIP. As part of the process to reduce or eliminate repetitive flooding to structures across the United States, FEMA has developed an official Repetitive Loss Strategy. The purpose behind the national strategy is to identify, catalog, and propose mitigation measure to reduce flood losses to the relatively few numbers of structures that absorb the majority of the premium dollars from the national flood insurance fund.

A repetitive loss property is defined by FEMA as "a property for which two or more NFIP losses of at least \$1,000 each have been paid within any 10-year period since 1978". A repetitive loss property may or may not be currently insured by the NFIP. There are 28 repetitive loss buildings in the unincorporated County,

9 of which are insured and a total of \$1,122,171 million was paid out. Fourteen repetitive loss structures are located in A zone, with total payments equaling \$602,136. There are twelve repetitive loss building is located in zone B, C, and X, with payments totaling \$503,833. There is one target repetitive loss structure in the unincorporated County. There are no Severe Repetitive Loss properties, as defined by FEMA, anywhere in the County. Refer to the jurisdictional annexes for repetitive loss analysis for each participating jurisdiction.

Table 5-88 San Luis Obispo County Flood Insurance Policy Information

Jurisdiction	Policies	Insurance in Force	No. of Paid Losses	Total Losses Paid
Arroyo Grande	110	\$30,278,600	19	\$412,457
Atascadero	107	\$13,507,500	18	\$259,834
City of San Luis Obispo	736	\$223,380,300	83	\$456,370
Grover Beach	36	\$9,940,700	2	\$14,882
Morro Bay	175	\$54,027,900	17	\$243,005
Paso Robles	65	\$18,517,800	5	\$50,642
Pismo Beach	116	\$37,758,200	7	\$73,623
Unincorporated	902	\$241,825,900	191	\$3,076,206
Total	2,247	\$629,236,900	342	\$4,587,019

Source: FEMA National Flood Insurance Program Community Information System

People

The total number of residential properties in each floodplain was multiplied by the average household size of 2.51 persons for the County (ACS 2013-2017 estimates), and that total was multiplied by the County Occupancy Factor (95%) to estimate resident population. Based on this analysis, which accounts for residents only and not workers, there are 5,306 residents living in the 100-year flood zone throughout the County of San Luis Obispo. Of all study areas, the unincorporated county has the most residents living in the 1% annual chance flood area, followed by the City of San Luis Obispo. It should also be noted that this does not consider the student population living seasonally in the City of San Luis Obispo and these number may actually be greater with that additional population accounted for. Table 5-89 below details population estimates by jurisdiction, followed by similar tables for the 500-year floodplain.

Table 5-89 Population Living in 1% Annual Chance Flood Hazard Zone

Jurisdiction	Population
Arroyo Grande	389
Atascadero	226
City of San Luis Obispo	1,448
Grover Beach	68
Morro Bay	294
Paso Robles	158
Pismo Beach	193
Unincorporated	2,530
Total	5,306

Source: Wood GIS analysis on San Luis Obispo County's Assessor's Office/Parcel Quest data and FEMA NFHL

The same analysis was conducted for the 500-year floodplain, indicating that there are 25,414 residents living in the 500-year flood zone throughout San Luis Obispo County. The majority of people living in this



floodplain are residents of the Paso Robles, with over 12,000 people in the 500-year floodplain. This population distribution is shown in Table 5-90.

Table 5-90 Population Living in 0.2% Annual Chance Flood Hazard Zone

Jurisdiction	Population
Arroyo Grande	1,084
Atascadero	5,763
City of San Luis Obispo	3,313
Grover Beach	3
Morro Bay	615
Paso Robles	12,623
Pismo Beach	188
Unincorporated	1,825
Total	25,414

Source: Wood GIS analysis on San Luis Obispo County's Assessor's Office/Parcel Quest data and FEMA NFHL

Social Vulnerability

Flood hazards especially affect the socioeconomically vulnerable, those with disabilities, minorities, and housing or transportation vulnerable populations. This is because vulnerable populations may be unable to evacuate in a timely manner; may lose access to critical resources including life support technology or medicine due to flood damages; may be found in situations where their health conditions are exacerbated due to stagnant water-borne pathogens (or other communicable diseases); and may be more likely to drown, get injured, or suffer from hypothermia due to physical or mental impairments. Based on the SoVI data presented and discussed in subsection 4.4.1, some of the most socially vulnerable areas of the County are also vulnerable to flooding. This includes Oceano, Grover Beach, Paso Robles, and San Luis Obispo. A 500-year event in Paso Robles could have extensive societal impacts. Oceano and Grover Beach as well as Morro Bay, Los Osos and San Simeon may be of particular interest again due to their location along the coast, as they may see increased hazard risk due to combined exposure to tsunamis, coastal erosion, or sea level rise.

Critical Facilities and Infrastructure

Key support facilities and structures most necessary to withstand the impacts of, and response to, natural disasters are referred to as critical facilities. Examples of these critical facility types include utilities, transportation infrastructure, and emergency response and services facilities, given failures of component along major lifelines or even closures or inaccessibility to key emergency facilities could limit if not completely cut off transmission of commodities, essential services, and other potentially catastrophic repercussions. The following two tables summarize the number and types of critical facilities found to be at risk of flooding, based on flood hazard area in the first, and then by jurisdiction in the second table. These results were found by performing overlay analysis of the critical facilities and the flood hazard zone layers in GIS. Most of these facilities at risk are found in Paso Robles (37), though a few also in the unincorporated portions of the county and other jurisdictions with the exception of Grover Beach. Overall, a total of 89 critical facilities are found within flood hazard areas across the county; the majority (65) are located in the 500-Year or 0.2% annual chance flood hazard zone. Details on the specific properties at risk are found in Appendix E.

Table 5-91 Critical Facilities in Flood Hazard Zones, by Jurisdiction

Flood Hazard Zone	Critical Facility Count
100-Year	23
500-Year	65
VE	1
Total	89

Source: San Luis Obispo County Planning & Building Dept/GIS, HIFLD, FEMA's NFHL, San Luis Obispo County Community Services Districts, Wood GIS analysis

Table 5-92 Critical Facilities in Flood Hazard Zones, by Flood Hazard Area

Jurisdiction	Critical Facility Count
Arroyo Grande	3
Atascadero	13
City of San Luis Obispo	13
Morro Bay	8
Paso Robles	37
Pismo Beach	1
Unincorporated	14
Total	89

Source: San Luis Obispo County Planning & Building Dept/GIS, HIFLD, FEMA's NFHL, San Luis Obispo County Community Services Districts, Wood GIS analysis

Economy

Flooding can have a major economic impact on the economy. Based on the flood loss analysis, there are 478 commercial structures worth an estimated \$700 M in total value directly at risk to flooding in the 1% annual chance zone. Based on the loss analysis (described further above) this could result in approximately \$180M in direct losses. This does not account for other indirect losses such as business interruption, lost wages and other downtime costs.

Effects on the agriculture economy can be devastating. Flooding can damage crops and livestock. In addition to the obvious impacts on crops and animals, flooding can have deleterious effects on soil and the ability to reinvigorate the agricultural activities impacted once the flood waters recede. Damage to water resources such as underground irrigation systems, water storage reservoirs, springs and other natural water bodies could have a serious effect upon agriculture operations.

Historic, Cultural, and Natural Resources

San Luis Obispo County has significant historic, cultural, and natural resources located throughout the County as previously described. GIS analysis indicates that a total of thirty-eight (38) historic properties are potentially at risk to flooding. Of those thirty-eight historic properties, sixteen (16) are at risk of a 100-year flood event and twenty-one (21) historic properties are at risk of inundation in a 500-year flood. Details on the specific properties at risk are found in Appendix E.

Natural areas within the floodplain often benefit from periodic flooding as a naturally recurring phenomenon. These natural areas often reduce flood impacts by allowing absorption and infiltration of floodwaters. Natural resources are generally resistant to flooding except where natural landscapes and soil compositions have been altered for human development or after periods of previous disasters such as

drought and fire. Wetlands, for example, exist because of natural flooding incidents. Areas that are no longer wetlands may suffer from oversaturation of water, as will areas that are particularly impacted by drought. Areas recently suffering from wildfire damage may erode because of flooding, which can permanently alter an ecological system.

Future Development

Flooding and floodplain management are significant issues for San Luis Obispo County. The potential or likelihood of a flood event in the county increases with the annual onset of heavy rains in winter and spring months. Much of the historical growth in the problem areas connected with flooding and stormwater runoff include erosion, sedimentation, degradation of water quality, losses of environmental resources, and certain health hazards. Future annexations of unincorporated areas could significantly add to the number of flood-prone structures in San Luis Obispo County.

For NFIP participating communities, floodplain management practices implemented through local floodplain management ordinances should mitigate the flood risk to new development in floodplains.

The development trend in the San Luis Obispo County planning area is steady, significant growth. Much of this growth is occurring in the urban and coastal areas, which can increase stormwater runoff.

The 2018 Caltrans Economic Forecast at the county-level for all 58 counties in California for 2018-2050, projects that San Luis Obispo County's population will continue to increase by 0.4 annually through 2023, 97 percent being from net migration (Caltrans 2018). The report also notes that with this growth in population and the County's large amount of buildable land, housing development will likely be spread out rather than developments with higher density. Such growth will consume previously undeveloped acres, and the increase in impervious surfaces could affect existing drainage and flood control facilities.

The potential for flooding may increase as stormwater is channelized due to land development. Such changes can create localized flooding problems inside and outside of natural floodplains by altering or confining natural drainage channels. Floodplain modeling and master planning should be based on buildout land use to ensure that all new development remains safe from future flooding. While local floodplain management, stormwater management, and water quality regulations and policies address these changes on a site-by-site basis, their cumulative effects can have a negative impact on the floodplain.

The County of San Luis Obispo's Local floodplain management ordinance require that new construction be built with the lowest floor elevated a minimum of one foot above the base flood (100-year) elevation. New development that adheres to the elevation requirements in addition to other requirements for maintaining elevation certificates and implementing stormwater program elements and erosion or sediment controls for all new development in the floodplain should help protect development from 100-year floods.

For this plan, an additional GIS overlay analysis of building construction permits for residential and commercial properties was performed across the county, pulling from permits submitted from 2014 to early 2019. This assessment provides a general idea of how many future properties may be constructed, or may have upgrades done, within flood hazard zones (see the table right below). More detail on the specific types of permits granted, particularly the kind of work class and case type for each permit group, can be found under the Asset Summary section of this plan.

Table 5-93 Building Permits Submitted within Flood Hazard Zones from 2014-2019

Flood Event	Work Class	Case Type	Work Class Type Total
100-Year	Conditional Use Permit	Land Use	24
	Minor Use Permit	Land Use	44
	New Structure	PMTC - Commercial Permit	40
		PMTR - Residential Permit	87
	TOTAL		195
500-Year	Conditional Use Permit	Land Use	3
	Minor Use Permit	Land Use	58
	New Structure	PMTC - Commercial Permit	10
		PMTR - Residential Permit	40
	TOTAL		111
VE	Minor Use Permit	Land Use	1
	TOTAL		1
GRAND TOTAL			307

Source: San Luis Obispo County Planning & Building Department, FEMA's NFHL, Wood GIS analysis

Risk Summary

- Overall significance of the flood hazard is Medium.
- Countywide there are 15,328 structures at risk worth \$3.5B, with a loss estimate of \$5.6B
- The City of San Luis Obispo accounts for 54% of the total losses in the 100-year floodplain.
- Commercial structures account for 43% of total losses in the 100-year floodplain, with a loss estimate of \$183M
- Paso Robles accounts for 50% of the total losses in the 500-year floodplain.
- Residential structures account for 51% of total losses in the 500-year floodplain.
- Countywide approximately 5,306 persons live in the 100-year floodplain, of which 2,530 are in the unincorporated areas
- There are 25,414 persons within the 500-year floodplain, of which 12,623 people are within the City of Paso Robles.
- A total of 89 critical facilities are found in 100-year (23 facilities), 500-year (65 facilities), or VE/coastal (1) flood zones in the county. Most of them are in Paso Robles, with 13 or less in each of the other incorporated jurisdictions as well as the unincorporated lands.
- *Related hazards:* Adverse weather: Thunderstorm/Heavy Rain, Coastal Storm/Coastal Erosion/Sea Level Rise, Wildfire, Landslide and Debris Flow.

Table 5-94 Flood Hazard Risk Summary

Jurisdiction	Geographic Area	Probability of Future Occurrence	Magnitude/Severity	Overall Significance
San Luis Obispo County	Significant	Likely	Critical	Medium
City of Arroyo Grande	Significant	Highly Likely	Limited	Medium
City of Atascadero	Significant	Occasional	Critical	Medium
City of Grover Beach	Limited	Occasional	Limited	Low
City of Morro Bay	Extensive	Highly Likely	Critical	High
City of Paso Robles	Significant	Likely	Limited	High
City of Pismo Beach	Significant	Likely	Limited	Medium
City of San Luis Obispo	Limited	Occasional	Limited	Medium
Avila Beach CSD	Significant	Highly Likely	Limited	Medium
Ground Squirrel Hollow CSD	Limited	Occasional	Limited	Low
Heritage Ranch CSD	Extensive	Likely	Critical	High
Los Osos CSD	Significant	Likely	Limited	Low
Nipomo CSD	Limited	Occasional	Limited	Low
San Miguel CSD	Limited	Occasional	Limited	Medium
San Simeon CSD	Limited	Likely	Negligible	Low
Templeton CSD	Limited	Likely	Limited	Low
Cayucos Sanitary District	Significant	Likely	Critical	High
Port San Luis Harbor District	Limited	Highly Likely	Limited	Medium
San Luis Obispo FCWCD	Significant	Likely	Critical	Medium
South San Luis Obispo Sanitary District	Significant	Highly Likely	Limited	Medium



5.3.12 Landslides and Debris Flow

Hazard/Problem Definition

A landslide is a geologic hazard where the force of gravity combines with other factors to cause earth material to move or slide down an incline. Some landslides move slowly and cause damage gradually, whereas others move so rapidly that they can destroy property and take lives suddenly and unexpectedly. Slopes with the greatest potential for sliding are between 34 degrees and 37 degrees. Although steep slopes are commonly present where landslides occur, it is not necessary for the slopes to be long.

Debris flows are a mixture of rock fragments, soil, vegetation, water and, in some cases, entrained air that flows downhill as a fluid. Debris flows can range in consistency from that of freshly mixed concrete to running water. Debris flows can be further classified as mudflows and earth flows depending on the ratio of water to soil and rock debris.

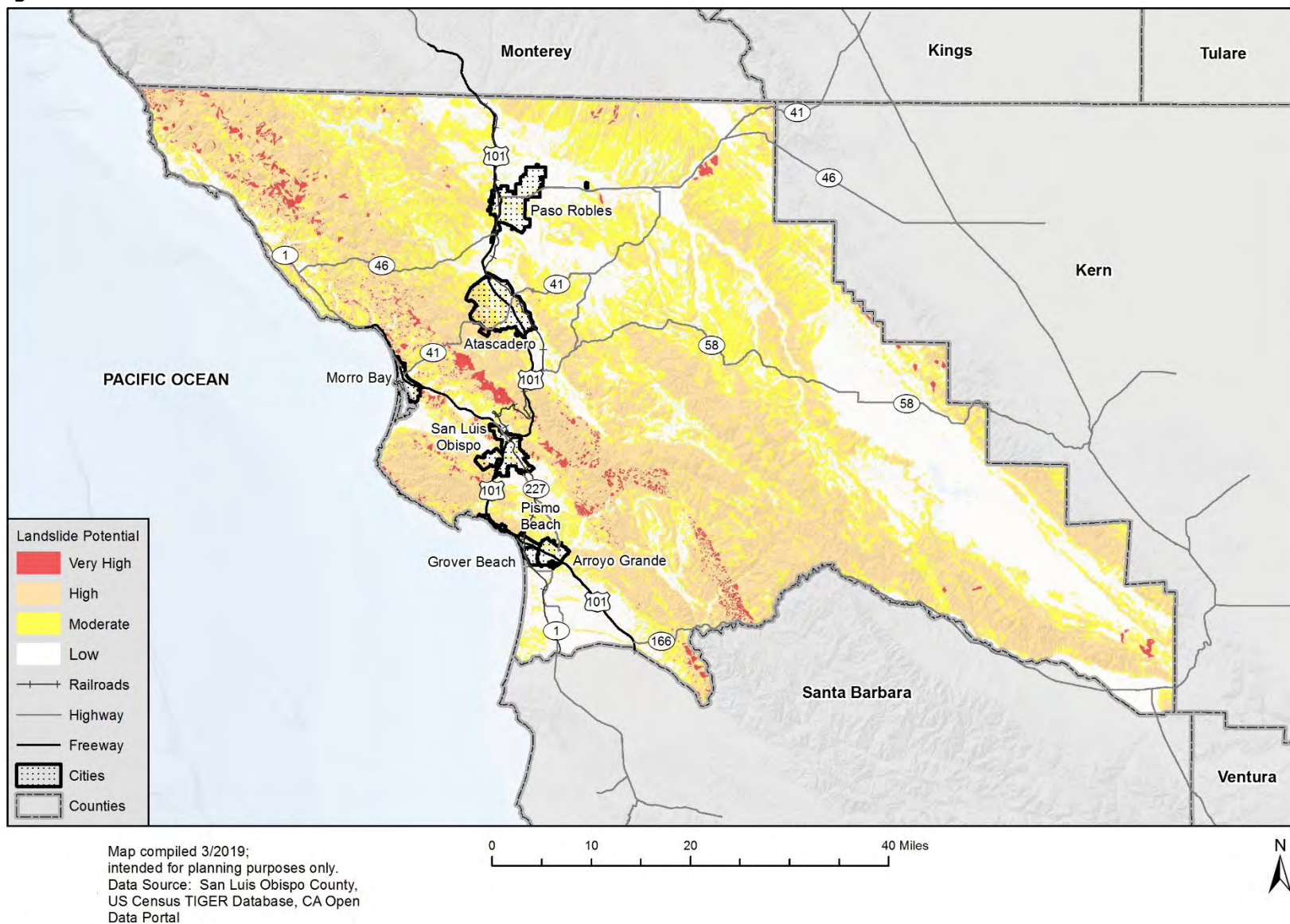
Landslides, rockslides, and debris flows occur continuously on all slopes; some processes act very slowly, while others occur very suddenly, often with disastrous results. Landslide and debris flow problems can be caused by land mismanagement, particularly in mountain, canyon, and coastal regions. In areas burned by forest and brush fires, a lower threshold of precipitation may initiate landslides and debris flows. As human populations expand over more of the land surface, these processes become an increasing concern.

There are predictable relationships between local geology and landslides, rockslides, and debris flows. The down-slope movement of earth material, either as a landslide, debris flow, mudslide, or rockslide, is part of the continuous, natural process of erosion. This process, however, can be influenced by a variety of causes that change the stability of the slope. Slope instability may result from natural processes, such as the erosion of the toe of a slope by a stream, or by ground shaking caused by an earthquake. Slopes can also be modified artificially by grading, or by the addition of water or structures to a slope. Development that occurs on a slope can substantially increase the frequency and extent of potential slope stability hazards. Knowledge of these relationships can improve planning and reduce vulnerability. Slope stability is dependent on many factors and their interrelationships, including rock type, moisture content, slope steepness, and natural or man-made undercutting.

Geographic Area

In San Luis Obispo County, there are several geologic formations commonly associated with slope stability problems. The data presented on the following presents a summary of landslide hazard potential.

Figure 5-74 Landslide Potential



The geologic formations commonly associated with slope stability problems in San Luis Obispo County, include the Franciscan, Rincon, Toro, and Monterey formations. Of these, the Franciscan is the most well-known formation known for slope instability. Numerous landslides within the Franciscan complex are observable along the Highway 1 corridor from San Luis Obispo to San Simeon. Numerous landslides have also been mapped in the Franciscan and Toro formations along Highway 101 on the Cuesta Grade. Landslides in the Franciscan formation have impacted residences, roadway facilities, pipelines, and other infrastructure in the county. The Rincon and Toro formations have a similar geologic history of land sliding but are generally not as widespread as the Franciscan. An active landslide has also been identified in the vicinity of Harbor Terrace near Port San Luis Harbor west of Avila Beach.

Geologic formations located in San Luis Obispo County that present a moderate slope stability hazard potential include the Quaternary bedrock units such as the Paso Robles Formation and formations of equivalent age and composition. The susceptibility of areas underlain by these formations to slope stability impacts will vary based on a variety of site-specific factors, such as slope, the orientation of bedding planes, rainfall, characteristics of the overlying soil, and the type and extent of proposed slope modifications. In some areas, slopes may be stable in a natural condition, but alterations to the hillsides to accommodate urban development may cause unstable conditions that could adversely affect future development. Prior to the initiation of new development that could be adversely affected by slope movement, site specific evaluations are necessary to determine the hazard potential and to identify engineering design methods to minimize the risk of landslide-related damage.

San Luis Obispo County: Numerous large landslides are also mapped in the steep mountainous terrain of the Santa Lucia, La Panza and Caliente Mountain ranges and many canyons. Landslides of this type have been mapped in nearly all of the formations and are generally related to steep slopes, adverse geologic structure, weak or weathered formations, faulting, and wet slopes. To date, only limited geologic mapping has been performed to evaluate the presence of landslides in the hillside areas of the County. Most of the geologic studies to date have focused on large scale geologic structure, faulting, or other geologic issues and did not specifically evaluate land sliding. A significant amount of additional studies needs to be performed to identify and evaluate landslides to help reduce the potential for long term damage related to slope instability.

Sections 22/23.05.020 of the San Luis Obispo County Land Use Ordinance and Coastal Zone Land Use Ordinance, Titles 22 and 23 of the County Code, contain the county's grading ordinance. This ordinance outlines specific requirements for grading permits, procedures for reviewing and approving grading permits, inspection requirements for completed grading projects, and erosion and drainage requirements. Section 22/ 23.07.080 defines general requirements for identifying Geologic Study Areas (GSA) that would require a geology report to address landslide hazards.

Arroyo Grande: A majority of the existing development in Arroyo Grande is located on gently inclined alluvial valley sediments and the hilly terrain north of Branch Street. The potential for slope stability hazards in valley areas is low to very low. The potential slope instability is greatest in the hilly areas of the City. The potential for slope instability in the sloping terrain can mostly be mitigated by applying building code requirements that provide minimum requirements for building construction and grading on sloping ground as those areas are not known to be underlain by large landslide features or unstable formations. However, there are relatively steep hillsides and canyons near the City, and as development moves into those areas, there could be greater potential for slope stability related concerns. A thorough

geologic/geotechnical study should be prepared prior to development for projects planned in those areas.

Title 7, Chapter 1, of the Arroyo Grande Municipal Code provides development standards adopted by the City pertaining to excavation, grading, erosion, and sediment control. This section specifies performance standards and other requirements intended to protect public health and safety and minimize hazards from excavation and filling activities.

Atascadero: Development in Atascadero generally has occurred in two areas: along the alluvial valley of the Salinas River and Highway 101, and in the relatively steeply sloping terrain of the Santa Lucia Mountains west of Highway 101. The primary bedrock geologic units exposed in the area include the Tertiary-age Santa Margarita, Vaqueros, and Monterey formations, and Cretaceous-age unnamed, Franciscan, Toro, and Atascadero formations. The potential for slope instability in the alluvial valleys is low to moderate because of fairly gentle slopes. Developments in steeper hillside areas have a known history of slope instability, and a moderate to very high hazard potential for slope instability problems.

Localized undercutting by streams or development could cause instability. Appropriate geologic studies should be performed prior to development to evaluate this increased level of risk.

The Franciscan and upper Cretaceous formations are exposed along the eastern flank of the Santa Lucia Mountains. These formations are the predominant geologic unit in the hilly southwestern portion of the City. In this area, 50 separate landslides have been mapped, encompassing 268 acres. The City has recently made repairs in this area to roadways damaged from land sliding. Although some of the mapped landslides may now be relatively stable, the concentration of old and recent landslides is indicative of relatively unstable slope conditions. This area is considered to have a high to very high potential for slope instability. Thorough geologic/geotechnical study should be prepared prior to development for projects planned in those areas.

Sections 9-4.138 through 9-4.146 of the Atascadero Zoning Ordinance provide development standards adopted by the City pertaining to excavation, grading, erosion, and sediment control. These sections specify performance standards and other requirements intended to protect public health and safety and minimize hazards from excavation and filling activities. In Atascadero, any grading on slopes at or exceeding ten percent must undergo environmental review pursuant to the California Environmental Quality Act (CEQA).

Grover Beach: Grover Beach is characterized by fairly gently inclined slopes with gradients of less than 50 percent on slopes consisting of older alluvium and late Pleistocene dune sands. The potential for slope stability concerns is low. Locally, there may be a potential for shallow slope failures in loose dune sands on areas of steep terrain. The potential for slope instability in the sloping terrain can mostly be mitigated by applying building code requirements that provide minimum requirements for building construction and grading on sloping ground as these areas are not known to be underlain by large landslide features or notoriously unstable formations.

Sections 8400 through 8423 of the Grover Beach Municipal Code provides for the development standards adopted by the City pertaining to excavation, grading, erosion, and sediment control. These sections specify performance standards and other requirements intended to protect public health and safety and minimize hazards from excavation and filling activities.

Morro Bay: Numerous studies have documented unstable, landslide prone slopes in the Morro Bay area east of Highway 1 and north of Highway 41. Many of the landslides mapped in the area are associated with the Franciscan mélange. The landslide hazards that have impacted residential development and lifeline facilities are most prevalent on west-facing slopes. Although some of the mapped landslides may now be relatively stable, the concentration of old and recent landslides is indicative of relatively unstable slope conditions. This area is considered to have a high to very high potential for slope instability. Thorough geologic/geotechnical study should be prepared prior to development for projects planned in those areas.

General Plan Policies S-6.1 and S-7.1 and Coastal Plan Policies 9.04 and 9.07 require that geology and soils reports be prepared to identify and evaluate potential adverse conditions from grading activities in specific areas of the City.

Paso Robles: A majority of the existing development in Paso Robles is located in areas of gently rolling hills with slope inclinations between 50 percent to 20 percent or less. The primary bedrock geologic unit in the area is the Paso Robles Formation. However, the Paso Robles Formation contains localized areas of relatively weak clay units, which are susceptible to small- to large-sized landslides. These landslides are not well mapped regionally but are often identified by site-specific studies.

The Salinas River flood plain is also an area of extensive development in the Paso Robles area. Because of the fairly gentle slopes, the potential for slope stability concerns in this area is generally low. The layered bedrock is folded and faulted and is subject to localized undercutting by streams or development. If the bedding becomes laterally unsupported, there is an increased potential for instability. Appropriate geologic studies should be performed prior to development to evaluate this increased level of risk.

Title 20 of the Paso Robles Municipal Code provides development standards that have been adopted by the City pertaining to excavation, grading, erosion, and sediment control. These sections specify performance standards and other requirements intended to protect public health and safety and minimize hazards from excavation and filling activities.

Pismo Beach: The potential for landslides is present on the hill sides to the north of highway 101 and along the Price Canyon corridor. The potential slope instability is greatest on the west facing slopes directly adjacent to the freeway and Price Canyon Road. The potential for slope instability in the sloping terrain can mostly be mitigated by applying building code requirements that provide minimum requirements for building construction and grading on sloping ground, as these areas are not known to be underlain by large landslide features or notoriously unstable formations. The City of Pismo Beach's Safety Element provides information on their policies related to land areas subject to hazards associated with steep slopes.

City of San Luis Obispo: The majority of the development in San Luis Obispo is in the valley area with a low to very low potential for slope instability. However, the hillside areas to the east, north and west of the City, as well as along the flanks of the Morros, are underlain by the Franciscan mélange, which is a source of significant slope instability. Areas of the City with steep topography and geologic formations prone to slope stability problems are depicted on Map 4. Because of the past slope stability related problems, a thorough geologic/ geotechnical study should be prepared prior to development for projects planned in those areas.

Surrounding area: Landslides in neighboring counties can have indirect consequences in San Luis Obispo County, notably in Monterey County to the north in the vicinity of Big Sur and Highway 1.

Extent (Magnitude/Severity)

The extent of landslides and debris flow events within the county range from negligible to significant. Landslides and rockslides can result in the destruction of infrastructure such as water and sewer lines, electrical and telecommunications utilities and drainage. Disrupted transportation routes occur occasionally, usually during heavy rain storms, and cause considerable inconvenience and result in economic impacts. The potential for complete destruction of buildings and death and injury from landslides and debris flow also exists.

Previous Occurrences

An active landslide has also been identified in the vicinity of Harbor Terrace near Port San Luis Harbor west of Avila Beach (2014 San Luis Obispo HMP).

In May 2017 the Mud Creek Slide buried a quarter mile section of scenic Highway 1 approximately nine miles north of the San Luis Obispo- Monterey County line. Caltrans estimates that over one million tons of rock and dirt fell during the slide, which is actually a combination of five slides. The affected section of Highway 1 was covered by a layer of dirt and rock about 35 to 40 feet deep. The section of Highway 1 closed by the slide re-opened in July 2018 (CA SHMP 2018).

In 2016 the Chimney Fire burned in San Luis Obispo County. Heavy rains in January 2017 lead to debris flows into Nacimiento Reservoir; Nacimiento Reservoir water is the only source of potable water for Heritage Ranch CSD (Heritage Ranch HM Planning Workbook 2019).

2/20/1996 - 4 to 6 inches of rain in the San Luis Obispo Co. Mountains caused Urban and small stream flooding and associated mudslides in the steep terrain and along Hwy 1 and 101 (NCEI).

The HMPC provided the following comments on previous landslide and debris flow incidents:

- Avila Beach Drive has been a problem area. The County has done repairs and improvements.
- Fremont Hall, a dorm on Cal Poly's campus remained closed for the 2018-2019 school years due to a potentially hazardous hillside behind the dorm. The dorm had previously been closed since February 2017 after heavy rainfall caused a mudslide that threatened the building (San Luis Obispo Tribune, 2017).
- The Cambria Community Healthcare District facility in Cambria was impacted by a landslide.
- County roads along Santa Rosa Creek are considered at risk by the County.
- Highway 41 between Morro Bay and Atascadero has been closed periodically due to rockslides.
- Impacts to high mountain roads in Poso and Lopez area has affected fire response as well as in Road 166, City of Atascadero and San Simeon
- Areas near the Hearst Castle have also seen movement.

Probability of Future Occurrences

Based on historical data and given the presence of landslide-susceptible geology and steep slopes in the planning area, landslides hazards are likely to continue on an annual basis, with damaging landslides less frequently. Landslides are usually a cascading effect of severe weather. The probability for more severe

and damaging landslides increases during El Nino years or severe winter storms. The potential for debris flows dramatically increases following a wildfire.

Climate Change Considerations

Landslides can result from intense rainfall and runoff events. Projected climate change-associated variance in rainfall events may result in more high-intensity events, which may increase landslide frequency. In addition, the increased potential of wildfire occurrence also escalates the risk of landslide and debris flows in the period following a fire, when slopes lack vegetation to stabilize soils and burned soil surfaces create more rainfall runoff. As climate change affects the length of the wildfire season, it is possible that a higher frequency of large fires may occur into late fall, when conditions remain dry, and then be followed immediately by intense rains early in the winter, as occurred with the Thomas Fire in December 2017 and subsequent Montecito and Carpinteria debris flows in January 2018 in adjacent Santa Barbara County (CA SHMP 2018).

Vulnerability

General Property

Landslides directly damage engineered structures in two general ways: 1) disruption of structural foundations caused by differential movement and deformation of the ground upon which the structure sits, and 2) physical impact of debris moving downslope against structures located in the travel path.

During the 2019 update of this plan, a GIS analysis of exposure to landslide hazard areas was performed. GIS analysis indicates approximately \$4.9 billion of property improvements exposed, which takes into account improved values of properties; \$67 million of that value is within Very High potential areas. Table 5-95 summarizes landslide exposure by jurisdiction in the Moderate and above categories, based on an intersect of improved parcel center with landslide hazard areas. Based on this analysis there is a total of 17,724 developed properties potentially within landslide hazard areas rated Moderate to Very High; 301 of these properties are in Very High potential hazard areas and 8,508 in high potential areas. The greatest exposure of general property summarized in High and Very High in Table 5-96 is generally with residential properties, though the number of government/utilities properties in High and Very High landslide potential areas is also significant; note that the lack of replacement value for these parcels is due to these properties being exempt for tax assessment purposes. More specifics on the developed parcels exposed are included in Appendix E, including additional details on property types aggregated by landslide potential and jurisdiction. The unincorporated areas and the cities of Atascadero, Morro Bay, Pismo Beach and San Luis Obispo have the most properties in High or Very High landslide potential areas. There is a high level of uncertainty as to the actual risk to these exposed parcels, thus a more specific loss estimation is not provided. A more detailed, site specific analysis would be needed to assess actual risk within the identified parcels.

Figure 5-75 Improved Parcels Within High or Very High Landslide Potential Areas

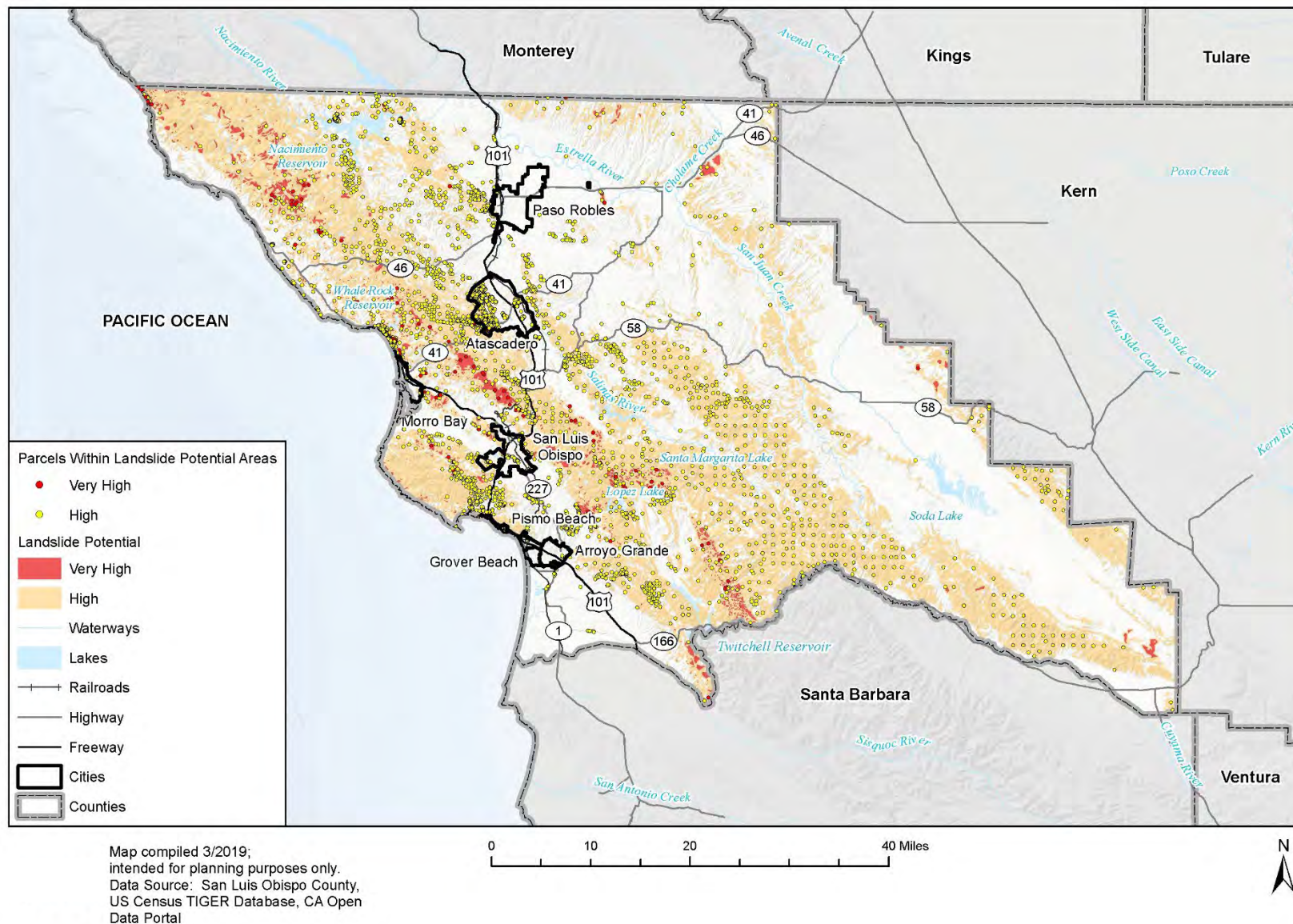


Table 5-95 Landslide Hazard Exposure – General Property Summary by Jurisdiction

Jurisdiction	Property Count - Moderate	Improved Value - Moderate	Property Count - High	Improved Value - High	Property Count - Very High	Improved Value - Very High
Arroyo Grande	509	\$171,390,279	3	\$254,572	-	
Atascadero	1,612	\$410,440,385	469	\$136,106,517	25	\$5,427,868
City of San Luis Obispo	721	\$230,452,509	174	\$70,603,528	1	--
Grover Beach	46	\$9,804,432	--	--	--	--
Morro Bay	378	\$95,102,718	310	\$60,562,714	14	\$4,815,420
Paso Robles	849	\$226,286,416	12	\$3,171,310	--	--
Pismo Beach	740	\$248,322,889	303	\$133,697,143	--	--
Unincorporated	7,768	\$2,336,482,101	3,529	\$788,977,779	261	\$57,479,097
TOTAL	12,623	\$3,728,281,729	4,800	\$1,193,373,563	301	\$67,722,385

Source: Parcel analysis by Wood

Table 5-96 Landslide Hazard Exposure –Property Summary by Type in High and Very High Potential

Property Type	Property Count - High	Improved Value - High	Property Count - Very High	Improved Value - Very High
Agricultural	113	\$40,457,302	8	\$2,175,923
Commercial	4	\$1,105,687	1	\$1,881,463
Government/Utilities	759	-	42	--
Industrial	1	\$383,096	21	\$2,011,942
Residential	3,162	\$1,029,473,446	213	\$60,349,742
Mobile/Manufact. Homes	209	\$26,130,440	5	\$400,501
Multi-Family Residential	102	\$19,767,227	2	\$514,606
Residential: Other	17	\$45,303,597	-	-
Vacant	251	\$28,144,278	9	\$388,208
Total	4,800	\$1,193,373,563	301	\$67,722,385

Source: Parcel analysis by Wood

People

People could be susceptible if they are caught in a landslide or debris flow, potentially leading to injury or death. There is also a danger to drivers operating vehicles, as rocks and debris can strike vehicles passing through the hazard area or cause dangerous shifts in roadways.

Social Vulnerability

In general, the areas for high landslide potential fall outside of the municipalities and census designated places, thus it is difficult to pinpoint specific areas of social vulnerability. Census tract data indicates possible coincidence of high and moderate landslide potential west of Paso Robles. Since landslide occurrence can be linked to earthquake and general seismic activity, it is possible that landslide and debris flow hazards may cause similar risks as those tied to earthquake (e.g. inability for disabled or vulnerable populations to evacuate in a timely manner, inability to communicate critical information to

those who may not speak English well, potential for populations to lose access to key resources such as life support technology or medicine).

Critical Facilities and Infrastructure

In addition to buildings, utilities and transportation structures are vulnerable to the impact and ground deformation caused by slope failures. They present a particular vulnerability because of their geographic extent and susceptibility to physical distress. Lifelines are generally linear structures that, because of their geographic extent, have a greater chance of being affected by ground failure due to greater hazard exposure.

Extension, bending, and compression caused by ground deformation can break lifelines. Failure of any component along the lifeline can result in failure to deliver service over a large region. Once broken, transmission of the commodity through the lifeline ceases, which can have catastrophic repercussions down the line: loss of power to critical facilities such as hospitals, impaired disposal of sewage, contamination of water supplies, disruption of all forms of transportation, release of flammable fuels, and so on. Therefore, the overall impact of lifeline failures, including secondary failure of systems that depend on lifelines, can be much greater than the impact of individual building failures.

The following two tables summarize the results of the GIS analysis, which indicate the types of critical facilities that are located in areas of landslide potential. Table 5-97 contains the number of critical facilities found within all landslide potential areas by jurisdiction. Table 5-98 summarizes the same information for all jurisdictions but broken up by landslide potential area. An analysis of bridges within areas of landslide potential areas is also summarized under Table 5-99. The majority of these facilities are communications facilities (microwave, cellular, AM and FM transmission towers). More specifics on the actual facilities can be referenced in Appendix E.

Table 5-97 Critical Facilities within Landslide Potential Zones, by Jurisdiction

Jurisdiction	Total Facilities
Atascadero	5
Morro Bay	1
Paso Robles	11
Pismo Beach	4
San Luis Obispo	13
Unincorporated	437
TOTAL	471

Source: San Luis Obispo County Planning & Building Department/GIS, HIFLD, San Luis Obispo County Community Services Districts, Wood GIS analysis

Table 5-98 Critical Facilities within Landslide Potential Areas, by Potential Category

Landslide Potential	Total Facilities
Moderate Landslide Potential	234
High Landslide Susceptibility	227
Very High Landslide Potential	10
TOTAL	471

Source: San Luis Obispo County Planning & Building Department/GIS, HIFLD, San Luis Obispo County Community Services Districts, Wood GIS analysis

Table 5-99 Landslide Exposure – Bridges

Landslide Potential	Total Bridges
Moderate	33
High	38
Very High	2
TOTAL	73

Source: Wood Analysis on National Bridge Inventory data, 2018

Economy

Economic impacts typically center around transportation routes temporarily closed by debris flow or landslide activity. These roads may be used to transport goods across the county or provide access by visitors and tourists. Depending on the amount of damage, the road may simply need to be cleaned off, or may need some level of reconstruction

Historic, Cultural, and Natural Resources

As primarily a natural process, landslides and debris flows can have varying impacts to the natural environment; debris flows have the potential to permanently alter the natural landscape.

GIS analysis indicates that 18 historic properties are potentially at risk to landslides; six are in high hazard and 12 are in moderate hazard potential areas. Specific property details can be referenced in Appendix E.

Future Development

The severity of landslide problems is directly related to the extent of human activity in hazard areas. Human activities such as property development and road construction can also exacerbate the occurrence of landslides. Future development should take place carefully to prevent landslide damage to property or people. Adverse effects can be mitigated by early recognition and avoiding incompatible land uses in these areas or by corrective engineering. Improving mapping and information on landslide hazards and incorporating this information into the development review process could prevent siting of structures and infrastructure in identified hazard areas. The county's grading ordinance and Section 22/ 23.07.080 defines general requirements for identifying Geologic Study Areas (GSA) that require a geology report to address landslide hazards should help mitigate risk to future development.

A GIS overlay analysis of building construction permits for residential and commercial properties was additionally performed across the county, pulling from permits submitted from 2014 to early 2019. This assessment provides a general idea of how many future properties may be constructed, or may have upgrades completed, in landslide potential areas (see Table 5-100). More detail on the specific types of permits granted, particularly the kind of work class and case type for each permit group, is contained in Table 5-101.

Table 5-100 Building Permits Submitted in Landslide Potential Areas from 2014-2019

Landslide Potential	Total Building Permits
Moderate	871
High	528
Very High	29
TOTAL	1,428

Source: San Luis Obispo County Planning & Building Department, Wood GIS analysis

Table 5-101 Details on Building Permits Granted in Landslide Potential Areas from 2014-2019

Landslide Potential	Work Class	Case Type	Work Class Type Total
Moderate	Conditional Use Permit	Land Use	40
	Minor Use Permit	Land Use	101
	New Structure	PMTC - Commercial Permit	185
		PMTR - Residential Permit	545
	TOTAL		871
High	Conditional Use Permit	Land Use	49
	Minor Use Permit	Land Use	69
	New Structure	PMTC - Commercial Permit	195
	New Structure	PMTR - Residential Permit	215
	TOTAL		528
Very High	Conditional Use Permit	Land Use	12
	Minor Use Permit	Land Use	5
	New Structure	PMTC - Commercial Permit	3
		PMTR - Residential Permit	9
	TOTAL		29
GRAND TOTAL			1,428

Source: San Luis Obispo County Planning & Building Department, Wood GIS analysis

Risk Summary

The overall significance of landslides and debris flows in San Luis Obispo County is Medium. These events are recurring in nature and could disrupt critical elements of the county's infrastructure.

- The geologic formations commonly associated with slope stability problems in San Luis Obispo County, include the Franciscan, Rincon, Toro, and Monterey formations. Of these, the Franciscan is the most well-known formation known for slope instability.
- Numerous landslides within the Franciscan complex are observable along the Highway 1 corridor from San Luis Obispo to San Simeon.
- *Effects on people:* People and property are at risk from landslides and debris flow in San Luis Obispo County. For the most part, past incidents have not resulted in significant injuries or loss of life.
- *Effects on property:* Property loss is rare but is usually significant when it occurs; a high number of structures are built on or near landslide potential areas based on GIS analysis.
- *Effects on economy:* Landslides and debris flows in adjacent counties can disrupt major transportation corridors along Highway 1, affecting the local tourist economy.
- *Effects on critical facilities and infrastructure:* Landslides and debris flows can result in the destruction of infrastructure such as water and sewer lines, electrical and telecommunications utilities and drainage. Disrupted transportation routes occur occasionally, usually during heavy rain storms, and cause considerable inconvenience. Based on GIS analysis, there are 10 critical facilities found within very high landslide susceptibility zones, 227 facilities in high landslide susceptibility zones, and 234 in moderate landslide zones, for a total of 471 facilities at risk of this hazard. The majority are in the

unincorporated portions of the county (437), with 13 in San Luis Obispo City, 11 in Paso Robles, 5 in Atascadero, 4 in Pismo Beach, and 1 in Morro Bay.

- *Related Hazards:* Earthquake, Coastal Storm/Coastal Erosion/Sea Level Rise, Adverse Weather, Wildfire,

Table 5-102 Landslide and Debris Flow Hazards Risk Summary

Jurisdiction	Geographic Area	Probability of Future Occurrence	Magnitude/Severity (Extent)	Overall Significance
San Luis Obispo County	Significant	Likely	Critical	Medium
City of Arroyo Grande	Limited	Unlikely	Limited	Low
City of Atascadero	Significant	Likely	Significant	Medium
City of Grover Beach	Limited	Unlikely	Limited	Low
City of Morro Bay	Limited	Occasional	Limited	Medium
City of Paso Robles	Limited	Likely	Limited	High
City of Pismo Beach	Significant	Likely	Limited	Medium
City of San Luis Obispo	Limited	Occasional	Limited	Low
Avila Beach CSD	Significant	Occasional	Limited	Medium
Ground Squirrel Hollow CSD	Limited	Highly Likely	Negligible	Medium
Heritage Ranch CSD	Extensive	Likely	Negligible	High
Los Osos CSD	Limited	Occasional	Limited	Low
Nipomo CSD	Limited	Unlikely	Limited	Low
San Miguel CSD	Limited	Occasional	Limited	Medium
San Simeon CSD	Significant	Likely	Catastrophic	Medium
Templeton CSD	Limited	Unlikely	Limited	Low
Cayucos Sanitary District	Limited	Occasional	Limited	Medium
Port San Luis Harbor District	Significant	Highly Likely	Critical	Medium
San Luis Obispo FCWCD	Significant	Likely	Critical	Medium
South San Luis Obispo Sanitary District	Limited	Unlikely	Limited	Low

5.3.13 Soil Hazards: Land Subsidence

Hazard/Problem Description

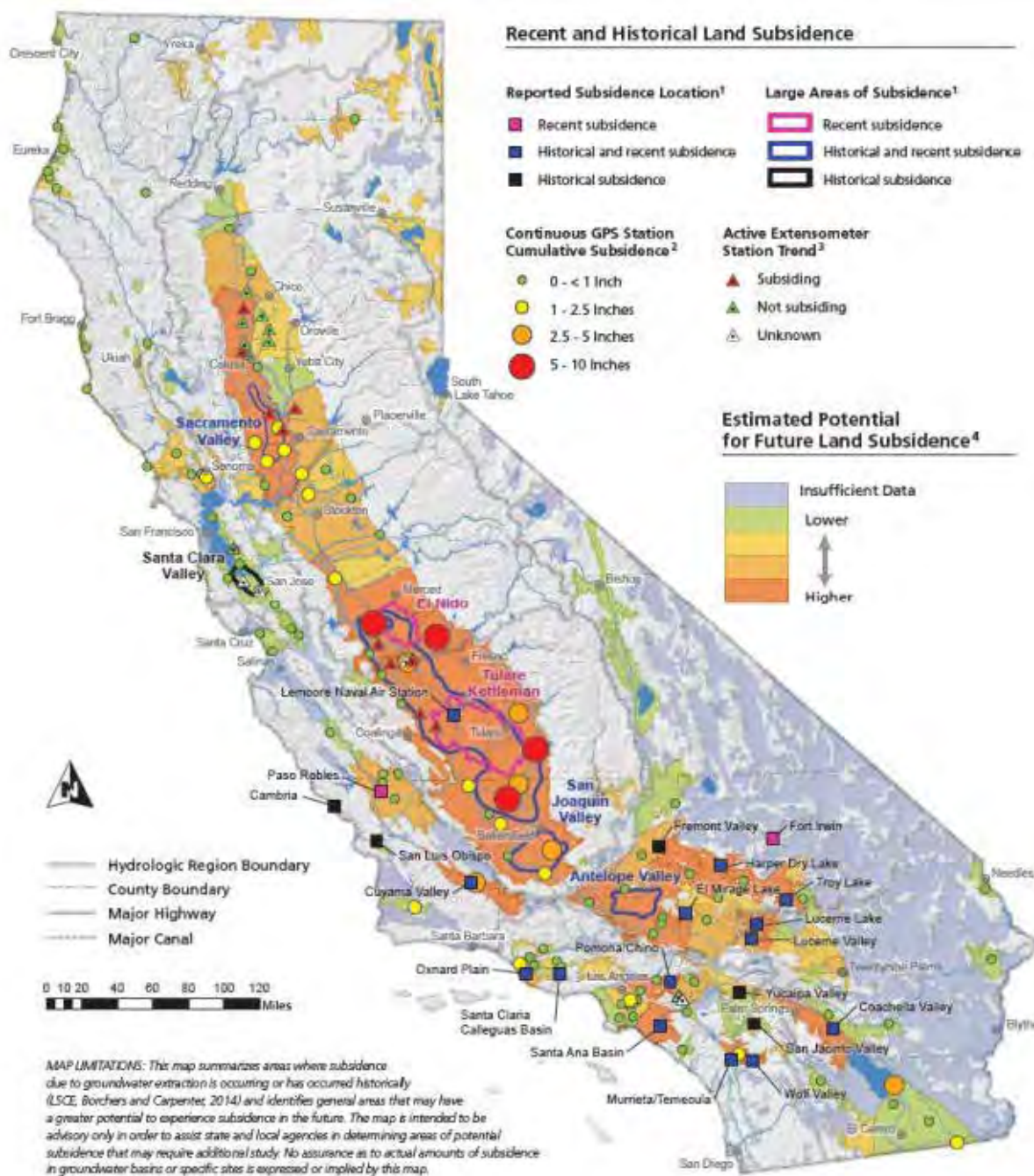
Land subsidence is defined as the vertical sinking of the land over natural or manmade underground voids. Subsidence is common in several areas of California, usually as a result of groundwater pumping, peat loss, or oil and gas extraction. Fluctuations in the level of underground water caused by pumping or by injecting fluids into the earth can initiate sinking to fill the empty space previously occupied by water or soluble minerals. Weight, including surface developments such as roads, reservoirs, and buildings, and manmade vibrations from such activities as blasting and heavy truck or train traffic can accelerate the natural processes of subsidence, or induce subsidence over manmade voids.

Subsidence can result in serious, localized structural damage to buildings, roads, irrigation ditches, canals, streams, underground utilities, and pipelines. The HMPC noted that sinkholes have occurred near a hospital as a result of groundwater pumping. Subsidence will be addressed in the Groundwater Sustainability Plans currently under development.

Geographic Area

Figure 5-76 below shows areas statewide that have a recent history of subsidence or are known to be at an increased risk of subsidence. Most studies and concern about land subsidence in California have focused on the Santa Clara Valley, San Joaquin Valley, Sacramento Valley, Antelope Valley, Coachella Valley, and Mojave River Basin Areas.

Figure 5-76 Land Subsidence in California



Source: California Department of Water Resources, November 2014 Public Update for Drought Response

A 2013 study conducted for the California Water Foundation by James W. Borchers and Michael Carpenter of Luhdorff & Scalmani Consulting Engineers observed:

"As in much of California, the population of San Luis Obispo County has grown substantially. Land has been converted from dry farming and grazing to irrigated agriculture and urban development. Groundwater has been relied upon to make up for shortages of surface water." (Borchers & Carpenter, p65)

That study identified several locations in San Luis Obispo County at increased risk of land subsidence, primarily the area surrounding Paso Robles. The City of San Luis Obispo and the village of Cambria have also experienced significant land subsidence, as described below under Previous Occurrences.

Extent (Magnitude/Severity)

A lack of data makes it difficult to predict the magnitude of future land subsidence incidents in San Luis Obispo County. As shown in Figure 5-76 above, most of the documented land subsidence in the county has been of 1" or less. However, that can still be enough to cause structural issues. The largest documented land subsidence measured in San Luis Obispo was a one-time drop of 12" that occurred in the City of San Luis Obispo in 1991. Ongoing displacements of as much as 12" per year have been documented in other parts of the state. The possibility of similar subsidence issues developing in San Luis Obispo County in the future cannot be ruled out.

Previous Occurrences

Land Subsidence had been an occasional issue in San Luis Obispo County for decades. The 2013 Borchers & Carpenter study listed three documented instances of significant land subsidence in San Luis Obispo County:

1976-1977, Cambria

"[E]arth fissures resulting from substantial decline of groundwater levels during the 1976-1977 drought damaged buildings and other infrastructure. Subsequently, the [Village] of Cambria developed additional sources of water for public supply; since then groundwater levels have not returned to historical low levels and fissuring has not reoccurred." (Borchers & Carpenter, p67)

1991, City of San Luis Obispo:

"The [City] of San Luis Obispo... is dependent on local water sources, including surface reservoirs and groundwater, for municipal water supplies. Water shortages became severe during the 1987-1992 drought. Mandatory water rationing was enforced in 1989. When one of the two surface-water reservoirs dropped to its minimum pool elevation in 1990, the city increased groundwater extraction dramatically to meet water demands.... In 1991, tenants and owners of businesses near two of the city wells began to notice unusual effects on their infrastructure. The Bear Valley Shopping Center, a strip mall on Los Osos Valley Road, experienced differential subsidence; floors were shifted unevenly. The middle of the long, narrow mall subsided less than either end of the building so that the floor had an inverted V-shape in its long dimension. Doors and windows would not close properly, and sidewalks sloped back toward the building so that slot drains had to be cut in order to remove pooling precipitation. A surveyor measured a 12-inch drop in the floor along the 45-foot length of one store. After the floor was leveled, a 1-foot step had to be built to allow safe access to the store.... The adjacent building housing the Sunset Honda dealership had to be razed and completely rebuilt. Many homes in the nearby development were damaged. Owners of the strip mall successfully sued the city and were awarded \$1 million in damages) After that settlement the automobile dealership and many homeowners filed claims with the city. Total cost of the claims was about \$2 million." (Borchers & Carpenter, p66-67)

1997, Paso Robles:

"[T]hree areas northeast of Paso Robles and one area northeast of Atascadero subsided during March 28-August 15, 1997. The maximum downward displacement northeast of Paso Robles during this 6-month period was 2 cm (0.8 in), whereas groundwater levels declined about 18 m (60 ft) during the

same period (Valentine et al., 2001). It is likely that concentrated pumping is responsible for localized land subsidence. The small area of deformation in the Atascadero area subsided 2.8 to 5.6 cm (about 1 to 2 in), coincident with seasonal water-level declines of about 16 m (54 ft). Small amounts of subsidence owing to seasonal changes in groundwater levels may be elastic and recoverable. However, during 2013 substantially declining groundwater levels have been reported. Many formerly reliable wells have gone dry. Interferograms spanning 1997-2013 could indicate whether declining groundwater levels have triggered inelastic compaction of aquifer sediments and permanent subsidence in Paso Robles area.” (Borchers & Carpenter, p66)

Additionally, the 2015 City of Atascadero Local Hazard Mitigation Plan noted that Highway 1 west of Atascadero closes almost every winter due to land subsidence. The HMPC also noted that in San Simon there has been a sinkhole problem near a hotel parking lot.

Probability of Future Occurrences

Occasional. Land subsidence has been a recurring issue in San Luis Obispo County for decades and can be expected to continue in the future. The frequency of future land subsidence incidents in the county will largely be dependent on the mitigation actions and pumping regulations initiated by the state, the county, and local regulations.

Climate Change Considerations

The most likely impact that climate change will have on land subsidence risk is the potential for extended and severe drought, which could likely result in more groundwater pumping and human-induced subsidence. During periods of drought, water levels may be drawn too low, which results in an irreversible compaction of aquitards. The water cannot recharge the layers, causing permanent subsidence and diminishment of groundwater storage capacity

Vulnerability

General Property

The lack of detailed data on land subsidence in San Luis Obispo County makes it difficult to quantify potential losses. Most subsidence instances result in relatively minor damage and settling of buildings. But in some cases, subsidence can result in serious structural damage to buildings, roads, irrigation ditches, underground utilities, and pipelines. Damages associated with the 1991 subsidence in City of San Luis Obispo resulted in \$2 million dollars’ worth of insurance claims. (\$3.7M in 2018 dollars.) Subsidence can also disrupt and alter the flow of surface or underground water, as well as reducing the future capacity of aquifers.

People

This hazard typically results in property damage, not risk to human life.

Social Vulnerability

Due to the gradual nature of land subsidence it is not anticipated to have social vulnerability consequences. Earthquake-induced ground failure and subsidence is considered in that hazard’s impacts.

Critical Facilities and Infrastructure

Linear infrastructure (roads, buried pipelines) tends to have the most risk to land subsidence. Statewide, subsidence has caused damage to dams and levees, canals, roads and bridges, water and sewer lines,

pipelines, well casings, and aircraft runways, in addition to a variety of buildings and other structures. The threat to the California Aqueduct has been identified as a significant concern for the state.

Economy

Damage resulting from land subsidence can cause direct economic losses in the form of needs structural repairs to affected buildings and facilities. As seen in the 1991 City of San Luis Obispo incident, subsidence can disrupt individual businesses causing temporary closures and sometimes necessitating significant repairs. It can also result in indirect losses, such as from increased taxes and decreased property values. However, the localized nature of most subsidence events limits their overall economic impact at the jurisdictional level.

Historic, Cultural, and Natural Resources

Historic and cultural facilities are just as susceptible to subsidence-related damage as other structures. However, there is not sufficient data to identify specific historical or cultural facilities at increased risk from this hazard.

Typically, there is little impact to the natural environment from land subsidence. However, it is possible for subsidence events to disrupt and alter the flow of surface or underground water, an impact that may not be noticed until long after the fact. Furthermore, soil compaction resulting from subsidence can permanently reduce aquifer capacity, impacting water supplies long into the future.

Future Development

While vulnerability to this hazard is not anticipated to increase with new development, increased water pumping resulting from new development has the potential to increase the frequency and severity of subsidence. This could be especially important in Paso Robles, given that area has higher subsidence potential and is projected to experience above-average growth. Increased efforts to monitor and manage groundwater pumping, increased accuracy of mapping, and emphasis on appropriate grading and ground compaction during development will help alleviate vulnerability for future development in unknown areas of risk.

Risk Summary

While a significant portion of San Luis Obispo County is potentially at risk from land subsidence, the localized nature of these incidents makes the overall significance of this hazard Low.

- The localized nature of land subsidence incidents limits their overall impact at the county level.
- While land subsidence can potentially occur throughout the planning area, the Paso Robles area has been identified as having a higher risk for the hazard. Historical subsidence incidents have also been documented in the City of San Luis Obispo.
- There is a shortage of data on this hazard in San Luis Obispo County. Most studies on land subsidence in California have focused on the Santa Clara Valley, San Joaquin Valley, Sacramento Valley, Antelope Valley, Coachella Valley, and Mojave River Basin Areas.
- Increased drought conditions resulting from climate change has the potential to result in more groundwater pumping, which could lead to more human-induced subsidence.
- Land subsidence can alter the flow of surface or underground water, an impact that may not be noticed until long after the fact.
- Related Hazards: Drought

Table 5-103 Subsidence Risk Summary

Jurisdiction	Geographic Area	Probability of Future Occurrence	Magnitude/Severity (Extent)	Overall Significance
San Luis Obispo County	Significant	Occasional	Negligible	Low
City of Arroyo Grande	Limited	Unlikely	Negligible	Low
City of Atascadero	Significant	Likely	Negligible	Low
City of Grover Beach	Limited	Unlikely	Negligible	Low
City of Morro Bay	Limited	Unlikely	Negligible	Low
City of Paso Robles	Likely	Limited	Negligible	High
City of Pismo Beach	Limited	Unlikely	Negligible	Low
City of San Luis Obispo	Significant	Occasional	Negligible	Low
Avila Beach CSD	Limited	Unlikely	Negligible	Low
Ground Squirrel Hollow CSD	Extensive	Occasional	Limited	Low
Heritage Ranch CSD	Extensive	Occasional	Limited	Low
Los Osos CSD	Limited	Unlikely	Negligible	Low
Nipomo CSD	Limited	Unlikely	Negligible	Low
San Miguel CSD	Limited	Occasional	Limited	Low
San Simeon CSD	Significant	Likely	Limited	Low
Templeton CSD	Limited	Unlikely	Negligible	Low
Cayucos Sanitary District	Limited	Unlikely	Negligible	Low
Port San Luis Harbor District	Limited	Unlikely	Negligible	Low
San Luis Obispo FCWCD	Significant	Occasional	Negligible	Low
South San Luis Obispo Sanitary District	Limited	Unlikely	Negligible	Low



5.3.14 Tsunami and Seiche

Hazard/Problem Definition

A *tsunami* is a wave, or a series of waves, caused by a displacement of the ocean floor, usually by movement along an earthquake fault. These events are also often referred to as tidal waves or seismic sea waves. In deep ocean water, tsunamis may travel as fast as 600 miles per hour. As they approach the shore, waves may increase in size and can cause extensive damage to coastal structures.

Per the SMS Tsunami Warning website, “after a sudden displacement of a large water volume by seismic activity (earthquake), the ocean floor is raised or dropped, and large tsunami waves can be formed by gravitational forces. Waves travel outward from the quake zone in all directions in a ripple effect (propagation). The resulting waves can be extremely dangerous and devastating to low-lying coastal areas as they enter shallow water and hit the shoreline. [However] a tsunami can occur at any state of the tide and even at low tide it will inundate coastal areas if the incoming waves surge high enough.”

Withdrawal of the sea may be a precursor to the arrival of the first wave. After the first wave appears, waves may continue to arrive at intervals for several hours. Intervals between successive waves may be similar. If the second wave appears 20 minutes after the first, it is likely that a third wave (if there is one) would arrive 20 minutes after the second. The first wave may not be the biggest. Yet the largest wave usually occurs within the first ten waves. The height the sea level rises above mean high tide line is referred to as runup.

Seiche (pronounced “seish”) is defined as oscillations of enclosed and semi-enclosed bodies of water, such as bays, lakes, or reservoirs, due to strong ground motion from seismic events, wind stress, volcanic eruptions, and local basin reflections of tsunami. Seiches can result in the creation of long-period waves which can cause water to overtop containment features or cause seiche runup on adjacent land masses, similar to tsunami runup.

Geographic Area

There are earthquake faults located all over the county as displayed in Figure 5-77 (more information under the Earthquake and Liquefaction section). Offshore faults and related seismic activity could cause tsunamis off the coast of San Luis Obispo County, even faults thousands of miles away.

Other earthquake faults, such as those near some of the bigger reservoirs and lakes like the Nacimiento Reservoir on the north (to the west of the Rinconada Fault Zone), Twitchell Reservoir (crossed by the West Huasna Fault Zone), and Soda Lake (near active or potentially active Fault Zones like San Juan) could affect these and other bodies of water and cause seiches, if they experienced seismic activity. As such, seiche hazards could occur in any reservoir or closed water body in the County, as well as in Morro and San Luis Bays. Figure 5-78 displays the tsunami-specific inundation zones, as determined by the California Department of Conservation. Tsunami inundation essentially affects most of the county's coastal areas, since flooding would originate from earthquake or fault movement from the Pacific Ocean.

Figure 5-77 Earthquake Faults in and Offshore of the County of San Luis Obispo

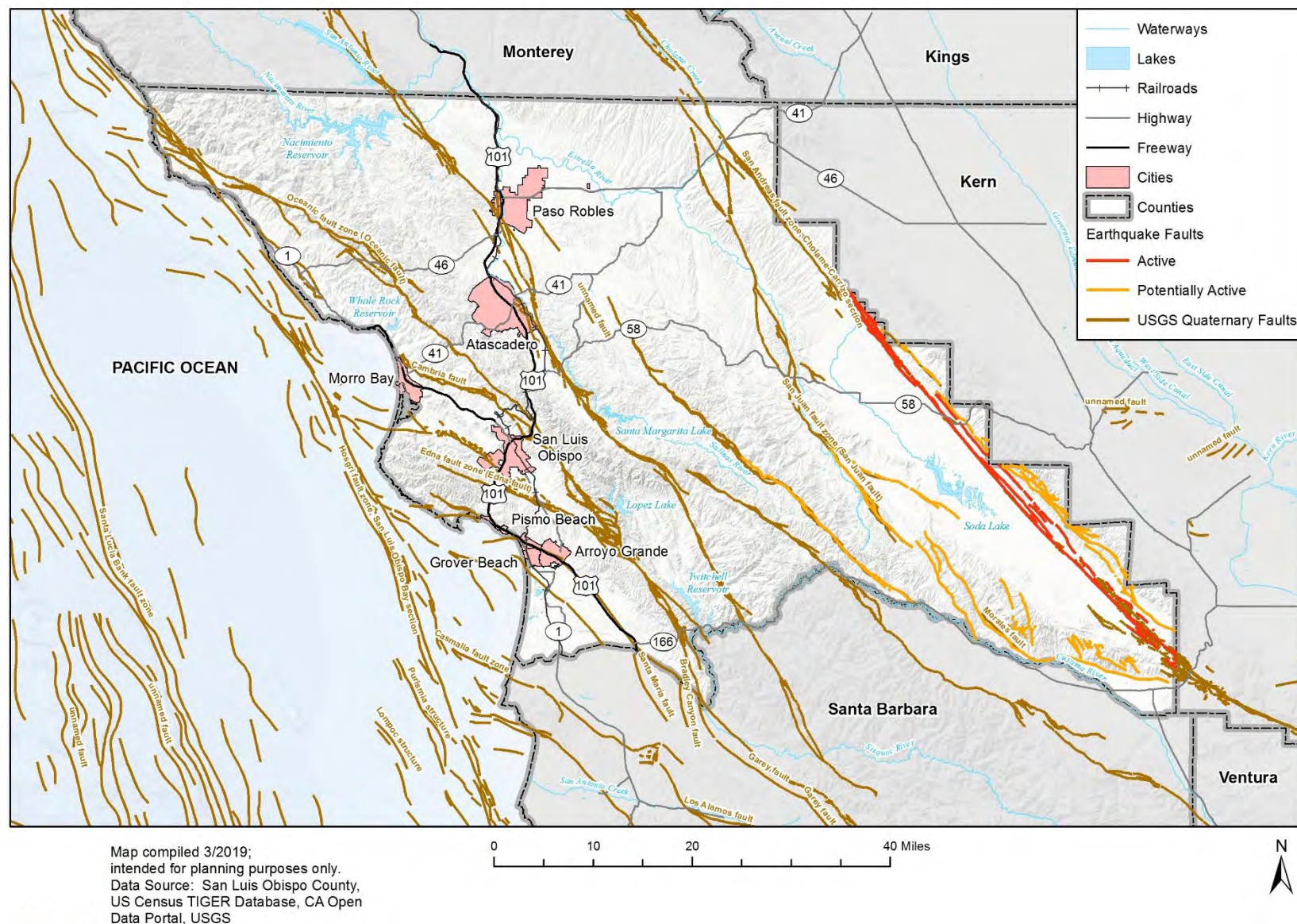


Figure 5-78 Tsunami Inundation Areas on the Coast of San Luis Obispo County



The Tsunami Response Plan for San Luis Obispo County uses as its planning basis all those coastal communities, recreation and developed areas with an elevation of 50 feet above mean sea level. In general, much of the coast of the County is protected by wide beaches, coastal dunes, or sea cliffs that provide protection for coastal developments. Areas most vulnerable to the tsunami hazard are developments or infra-structure near the mouths of streams that drain into the Pacific Ocean. They include:

- San Simeon Creek in San Simeon
- Santa Rosa Creek in Cambria
- Cayucos Creek, Little Cayucos Creek, Old Creek and Willow Creek in Cayucos,
- Morro and Avila Paul Creeks in Morro Bay, Chorro Creek in Morro Bay/ South Bay area
- San Luis Obispo Creek in Avila
- Pismo Creek in Pismo Beach, and
- Meadow Creek and Arroyo Grande Creek in Oceano

Extent (Magnitude/Severity)

As noted in Table 5-104, the historic record shows that significant tsunamis typically have been generated from distant earthquake sources. It has been estimated that the 100- and 500-year tsunami runups in the study area are based on far-field source generation locations (such as the Aleutian or Chile-Peru Trenches). Estimated tsunami runup along the Cayucos/Morro Bay coastline is approximately 9.5 feet to 24.2 feet for the 100-year and 500-year events, respectively. Those runups were calculated using astronomical high tides and compare well with recorded tsunamis that have occurred in other locations along the California Coast. However, the worst-case scenario would occur if a tsunami occurred during a meteorological high tide (storm surge), which would add an estimated 14.5 feet (4.5 meters) to the runup values calculated. Thus, with a worst-case scenario, the estimated tsunami runup for the 100-year and 500-year would be approximately elevation 24 and 39 feet above mean sea level, respectively.

When it comes to seiches, significant waves in these water-bodies are not anticipated because they are simply not large enough.

Past Occurrences

Tsunamis have done great damage to communities located on the California Coast. A tsunami in 1964, following an earthquake in Alaska, killed 12 people in Crescent City and damaged piers and boats in Morro Bay as the bay emptied and filled every 15 minutes for over an hour.

On March 11, 2011, a great quake (9.0) struck northern Japan. Nearly 12 hours later, approximately \$500,000 in damage was recorded to piers and docks in Morro Bay as a result of a tsunami from this earthquake. At the Center of Coastal Marine Science in Morro Bay (near the back of the bay), an oceanographer recorded a 6ft. surge, while fisherman and Coast Guard personnel estimated an 8-9ft. surge at the Coast Guard pier near the entrance to the harbor. Table 5-104 contains a summary of tsunami related events affecting the county from 1868 to 2018.

Table 5-104 Historical Tsunamis in San Luis Obispo County

Location	Date of Incident	Intensity	Description
Morro Bay	1868	Unknown	Unknown
Cayucos	4/16/1877	Height: 3.6 meters	California
Morro Bay	1878 Reportedly overtopped sand spit between the bay and the ocean	Unknown	Unknown
Pismo Beach	1927	Height: 1.8 meters	California
Avila & Morro Bay	4/1/1946	Height: 1.3 meters Source Magnitude: (Ms) 7.3	Source location: Alaska Source Event: E. Aleutian Islands Travel time: 5 hours
Avila Beach	11/4/1952	Height: 1.4 meters Source Mag.: (Ms) 8.2 (Mw) 9	Source location: Russia Source event: Kamchatka Travel time: 8 hours
Pismo Beach	5/22/1960	Height: 1.4 meters Source Mag.: (Ms) 9.5	Source location: Chile Source event: Central Chile
Avila & Morro Bay	3/28/1964	Height: 1.6 meters Source Mag.: (Ms) 9.2	Source location: Alaska Source Event: Gulf of Alaska Travel time: 5 hours
Morro Bay	3/12/2011	Height: 1.5 meters Source Mag.: (Ms) 9.0	Source location: Japan Source Event: Pacific Ocean near Honshu Travel time: 12 hours
Coast of San Luis Obispo County	9/16/2015	8.3 Magnitude	An 8.3 magnitude earthquake that struck off the coast of Chile, which led the National Tsunami Warning Center to issue a tsunami advisory at 1743 PST for a swath of California, from Orange County to north of San Luis Obispo. All beaches, harbors, piers, and marinas in the Cities of Seal Beach, Huntington Beach, Newport Beach, Laguna Beach, Dana Point and San Clemente, including County and State beaches were closed through 0500 PST on the 17th. Tsunami wave heights were observed to be just under one foot along the Orange County coast. The Orange County EOC reported no significant coastal flooding, but to be aware of the high likelihood of strong currents and waves dangerous to persons in or near the water. The advisory was lifted around 1100 PST on the 17th.

Source: County of San Luis Obispo Hazard Mitigation Plan 2014; NOAA's NCEI Storm Database 2019



Probability of Future Occurrences

Though damaging tsunamis have occurred infrequently in California, they are a possibility that must be considered in coastal communities. It is possible that tsunami flooding hazards will increase and worsen with sea level rise. The Central Coast is most vulnerable to a tsunami generated by an earthquake along the Aleutian-Alaska megathrust (an oceanic trench along a convergent plate boundary which runs along the southern coastline of Alaska and the Aleutian Islands). Present day inundation risk maps combining multiple tsunami generation sources have been produced by the California Geologic Survey and Department of Conservation. In the 151 years since the first recorded tsunami that affected the County of San Luis Obispo there have been 10 events total. This amounts to a probability of tsunami activity once every 15 years on average; as such, the expected future occurrence for this hazard is occasional.

Climate Change Considerations

Coastal areas in San Luis Obispo County are likely to become more vulnerable to tsunamis over the long term due to sea level rise trends which could contribute to deeper and more destructive tsunamis in the future (see the Coastal Hazards section for more details on sea level rise).

Vulnerability (Medium)

Tsunamis cause damages to many aspects of communities, including structures, properties, and those arising from the disruption of services. In addition, populations are often affected by being displaced or hurt by the inundation and destruction following a tsunami (e.g. debris generation). While seiches can be destructive as well, due to the lack of a GIS layer noting seiche-caused inundation or other damages, no further analysis is carried out to determine seiche vulnerability in the county, and the perceived vulnerability is low due to the relatively small water bodies that could be affected.

General Property

A tsunami event occurring along the coast of the County could have devastating effects in terms of property damage to piers, docks, floats, and to moored boats. During the 2019 update of this plan, a GIS analysis of improved property exposure to tsunami inundation areas was performed. GIS analysis indicates approximately \$594 million in improved values of parcels found to intersect with the tsunami inundation layer, though with contents added into the parcel valuation estimates the total value of parcels is \$886 million. About \$460 million of that value is within unincorporated county areas. The loss estimate percentage used for tsunami inundation is 100% of a parcel's total value, due to the powerful and destructive nature of seismic-induced wave flooding.

Table 5-105 and Table 5-106 summarize the improved values, content values, total values, loss estimates, and populations at risk of tsunami inundation in the county, broken up by jurisdiction in the first table, and property type in the second. To find which parcels were in inundation areas, an intersect of improved parcel centroids was performed with tsunami inundation areas.

Table 5-105 Parcels in Tsunami Inundation Areas, by Jurisdiction - San Luis Obispo County

Jurisdiction	Property Count	Improved Value	Content Value	Total Value	Loss Estimate	Population
Grover Beach	233	\$50,630,647	\$28,103,300	\$78,733,947	\$78,733,947	248
Morro Bay	332	\$96,361,707	\$49,256,580	\$145,618,287	\$145,618,287	602
Pismo Beach	427	\$134,807,357	\$66,105,867	\$200,913,224	\$200,913,224	876
Unincorporated	1,402	\$313,191,018	\$147,588,673	\$460,779,691	\$460,779,691	2,515
TOTAL	2,394	\$594,990,729	\$291,054,419	\$886,045,148	\$886,045,148	4,242

Source: CA Department of Conservation 2019; SLO County Planning and Building, and Assessor's Office; ParcelQuest; Wood Plc Parcel Analysis

Table 5-106 Parcels in Tsunami Inundation Areas by Parcel Type - San Luis Obispo County

Property Type	Property Count	Improved Value	Content Value	Total Value	Loss Estimate	Population
Agricultural	9	\$299,370	\$299,370	\$598,740	\$598,740	--
Commercial	181	\$54,605,778	\$54,605,778	\$109,211,556	\$109,211,556	--
Government/Utilities	197	\$398,544	--	\$398,544	\$398,544	--
Other/Exempt/Misc.	247	\$54,904,145	--	\$54,904,145	\$54,904,145	--
Residential	1,097	\$266,741,474	\$133,370,737	\$400,112,211	\$400,112,211	2,753
Mobile/Manufactured Homes	10	\$18,839,243	\$9,419,622	\$28,258,865	\$28,258,865	25
Multi-Family Residential	473	\$93,561,899	\$46,780,950	\$140,342,849	\$140,342,849	1,187
Residential: Other	110	\$76,048,695	\$38,024,348	\$114,073,043	\$114,073,043	276
Industrial	17	\$5,702,410	\$8,553,615	\$14,256,025	\$14,256,025	--
Vacant	53	\$23,889,171	--	\$23,889,171	\$23,889,171	--
TOTAL	2,394	\$594,990,729	\$291,054,419	\$886,045,148	\$886,045,148	4,242

Source: CA Department of Conservation 2019; SLO County Planning and Building, and Assessor's Office; ParcelQuest; Wood Plc Parcel Analysis

Based on this analysis there are 2,394 developed parcels within tsunami hazard areas (displayed in Figure 5-79). The greatest exposure of general property summarized in the tables above is generally with residential properties; note the lack (or low) improvement or content values for government/utilities and other/exempt/miscellaneous parcels is due to these properties being exempt for tax assessment purposes. More specifics on the developed parcels exposed to this hazard are included in Appendix E, while descriptions of the parcel analysis can be found in the Assets Summary section. The unincorporated portions of the county's coast have the most properties in tsunami inundation areas. There is a high level of uncertainty as to the actual risk to these exposed parcels (based on built properties' height above ground and other factors), thus a more specific loss estimation is not provided. A more detailed, site specific analysis would be needed to assess actual risk within the identified parcels.



Figure 5-79 **Parcels Within Tsunami Inundation Areas on the Coast of San Luis Obispo County**



People

People could be caught in either a tsunami wave or debris generated by tsunami inundation, potentially leading to injury or death. People affected by a tsunami event could also be displaced from their homes or be hurt inside them. Per the parcel analysis summarized in Table 5-105 and Table 5-106, the highest number of people at risk of tsunami inundation (a total of 2,515 of 4,242 potentially at risk county-wide) are located in the unincorporated coastal areas, mostly in residential properties of all types. The total people at risk per parcel were calculated by multiplying the average number of persons per household in the County of San Luis Obispo (2.51) times the number of residential parcels where tsunami inundation occurs. The HMPC noted that the population in Pismo and Grover Beach area swell with beachgoing tourists. The Oceano Dune State Park has as much as 10,000 to 40,000 visitors on a busy summer weekend and on holidays. Tourists may not be familiar with the risk tsunamis pose leading to them to not heed warnings or know where to go for safety.

Social Vulnerability

Since tsunamis are coastal hazards, those communities along the shore and where social vulnerability indices are higher will be of most concern. These include San Simeon, Grover Beach, and Oceano in particular, followed by medium-high vulnerability in Morro Bay and Los Osos. Tsunamis can cause injuries or death from direct wave force or indirectly, via debris generated or inundation caused in communities exposed. Evacuation aid will be of highest priority in those high vulnerability and high hazard exposure areas discussed, as people who rely on assistance for displacement (e.g. those with accessibility needs), or who require translation services or other specialized resources would be most vulnerable.

Critical Facilities

In addition to buildings, some utilities and transportation infrastructure are vulnerable to tsunamis and the inundation that flows inland. They present a particular vulnerability because of their proximity to the coast, such as Highway 1, and susceptibility to flooding and damage. Failure of any component along major utility and transportation lifelines can result in failure to deliver services over a large region or even fail to enable flows of people and goods (due to road closures, etc.). Once broken or interrupted in major ways, transmission of a commodity through the lifeline ceases, which can have catastrophic repercussions down the line: loss of power to critical facilities such as hospitals, impaired disposal of sewage, contamination of water supplies, potential release of flammable fuels, and so on. Therefore, the overall impact of lifeline failures and transportation infrastructure, including secondary failure of systems that depend on lifelines, can sometimes be much greater than the impact of individual building failures or breakages, if not significantly compound the already damaged buildings and internal contents.

The following table summarizes the number and types of critical facilities found to be at risk of tsunamis. These results were found by performing overlay analysis of the critical facilities and the tsunami inundation layers in GIS. Most of these facilities at risk are found in Morro Bay, though a few also in the unincorporated portions of the county and one in Grover Beach. Overall, a total of 14 critical facilities are found within tsunami inundation zones across the county.

Table 5-107 Critical Facilities in Tsunami Inundation Areas by Type - San Luis Obispo County

Jurisdiction	Critical Facility Type	Count
Grover Beach	Water Treatment Facilities	1
TOTAL		1
Morro Bay	Wastewater Treatment Plant	1
	Public Schools	1
	Energy Commission Facilities	1
	Power Plant	1
	Microwave Service Towers	3
TOTAL		7
Unincorporated	Wastewater Treatment Plant	2
	Local Law Enforcement	1
	Fire Stations	1
	Airport	1
	Energy Commission Facilities	1
TOTAL		6
GRAND TOTAL		14

Source: San Luis Obispo County Planning & Building Dept/GIS, HIFLD, CA Department of Conservation, San Luis Obispo County Community Services Districts, Wood GIS analysis

The Diablo Canyon Power Plant is not considered to be at risk as it is located on a marine terrace 85 feet above the sea level. The cooling intakes and release structures for the plant, which are located at sea level, are protected by natural barriers and a concrete jetty.

Economy

Economic impacts typically center around transportation routes closed by damages from debris carried by the wave activity, and hence general inundation. Roads used to transport goods across the county or provide access by visitors and tourists might be limited in use or even shut down, causing stoppage of services and commodity flows, and possibly leading to reduced revenues and economic activity.

Historic, Cultural, and Natural Resources

Tsunami inundation effects on the environment would be similar to those caused by flooding from other causes but would likely prove significantly more destructive. Water could erode beaches and cover the environment with debris. For the most part the environment is resilient and would be able to rebound from whatever damages occurred, though this process could take years. GIS analysis indicates the following six historic properties are potentially at risk to tsunami inundation.

Table 5-108 Historic Properties in Tsunami Inundation Areas - San Luis Obispo County

Name	Year	Area Plan
Southern Pacific Railroad Depot		San Luis Bay Area Plan-Inland
Avila Valley Historic Site 1		San Luis Bay Area Plan-Inland
Avila Valley Historic Site 2		San Luis Bay Area Plan-Inland
Captain James Cass House	1872	Estero Area Plan
Captain James Cass House & Adjacent Buildings	1872	Estero Area Plan
The Sebastian Store	1860	North Coast Area Plan

Source: County of San Luis Obispo Planning and Building Dept., 2019

Future Development

Areas slated for future development along the coast should consider potential impacts from tsunami inundation, particularly development of new critical facilities or vulnerable populations (e.g. schools). For this plan, a GIS overlay analysis of building construction permits for residential and commercial properties was additionally performed across the county, pulling from permits submitted from 2014 to early 2019. This assessment provides a general idea of how many future properties may be constructed, or may have upgrades done, within tsunami inundation areas (see Table 5-109). More detail on the specific types of permits granted, particularly the kind of work class and case type for each permit group, can be found under the Asset Summary section of this plan.

Table 5-109 Building Permits Submitted within Tsunami Inundation Areas from 2014-2019

Work Class	Case Type	Work Class Type Total
Conditional Use Permit	Land Use	26
Minor Use Permit	Land Use	115
New Structure	PMTC - Commercial Permit	23
	PMTR - Residential Permit	49
TOTAL		213

Source: San Luis Obispo County Planning & Building Department, CA Department of Conservation, Wood GIS analysis

Risk Summary

The overall significance of tsunami inundation and seiche activity in San Luis Obispo County is Medium. These events are recurring in nature and could disrupt critical elements of the County's infrastructure. In addition, San Luis Obispo County has a significant coastline with much recreation and development oriented toward the coast. The areas of Port San Luis and Morro Bay harbor are most vulnerable to tsunamis due to their location at the stream mouths of creeks draining into the Pacific Ocean.

- Based on historical evidence tsunami and seiche activity can occur in the county, though not frequently.
- *Effects on property:* Property loss can be significant depending on wave height; 2,394 improved parcels are found in tsunami inundation areas based on GIS analysis, most of these in unincorporated county portions with concentrations in the cities of Morro Bay, Pismo Beach, and Grover Beach,
- *Effects on people:* People are at risk from tsunamis in San Luis Obispo County. An estimated 4,242 people might be displaced from their homes or even hurt based on the location of their residences along the coastal inundation areas.
- *Effects on critical facilities and infrastructure:* Tsunami inundation can result in the destruction of infrastructure such as water and sewer lines, electrical and telecommunications utilities and drainage. Disrupted transportation routes are likely to occur as well and cause considerable inconvenience and closure of services or commodity flows. Based on GIS analysis, there are a total of 14 critical facilities found within tsunami inundation areas, with most of them in Morro Bay (7), some in the unincorporated portions of the county (6), and 1 in Grover Beach.
- *Effects on economy:* Tsunamis disrupt major transportation corridors, affecting the economy
- *Related hazards:* Earthquake, Coastal Storm/Coastal Erosion/Sea Level Rise.

Table 5-110 Tsunami Risk Summary

Jurisdiction	Geographic Area	Probability of Future Occurrence	Magnitude/Severity (Extent)	Overall Significance
San Luis Obispo County	Significant	Occasional	Limited	Medium
City of Arroyo Grande	N/A	N/A	N/A	N/A
City of Atascadero	N/A	N/A	N/A	N/A
City of Grover Beach	Limited	Occasional	Limited	Low
City of Morro Bay	Extensive	Occasional	Catastrophic	High
City of Paso Robles	N/A	N/A	N/A	N/A
City of Pismo Beach	Significant	Occasional	Critical	Medium
City of San Luis Obispo	N/A	N/A	N/A	N/A
Avila Beach CSD	Significant	Occasional	Critical	Medium
Ground Squirrel Hollow CSD	N/A	N/A	N/A	N/A
Heritage Ranch CSD	N/A	N/A	N/A	N/A
Los Osos CSD	Significant	Likely	Limited	Low
Nipomo CSD	N/A	N/A	N/A	N/A
San Miguel CSD	N/A	N/A	N/A	N/A
San Simeon CSD	Limited	Unlikely	Negligible	Low
Templeton CSD	N/A	N/A	N/A	N/A
Cayucos Sanitary District	Significant	Occasional	Critical	Medium
Port San Luis Harbor District	Significant	Occasional	Catastrophic	High
San Luis Obispo FCWCD	Significant	Occasional	Critical	Medium
South San Luis Obispo Sanitary District	Limited	Occasional	Limited	Low



5.3.15 Wildfires

Hazard/Problem Definition

A wildfire is an uncontrolled fire spreading through vegetative fuels, posing danger and destruction to property. While wildfires are often the direct result of lightning strikes, most are caused by powerlines or mechanical equipment, or are the result of human activities like debris burns, carelessness, or arson. Wildfires often start in undeveloped areas and public land areas, such as state and national forest lands, but can spread to urban areas where structures and other human development are more concentrated. The predominant dangers from wildfires are:

- Injury or loss of life to people in the affected area; and
- The destruction of vegetation, property, wildlife.

Communities throughout California are increasingly concerned about wildfire safety as increased development in the foothills and mountain areas and subsequent fire control practices have affected the natural cycle of the ecosystem. Wildfire risk is predominantly associated with wildland-urban interface areas, a general term that applies to development adjacent to landscapes that support wildfire. However, significant wildfires can also occur in heavily populated areas.

San Luis Obispo County is exposed to a variety of wildfire hazard conditions that varies based on fuels, topography, weather, and human behavior. CAL FIRE, as required by government code 51181, has undertaken a statewide program to map areas of potential wildfire severity, and to describe the potential for wildfires to occur in a given area; the resulting Fire Hazard Severity Zones are shown in Figure 5-80 below.

It should be noted that fires are also an important natural component of San Luis Obispo County's ecosystem. Wildlands need to burn periodically to naturally maintain viable environments. Fuel maintenance (controlled burns, mowing, cattle grazing and other means) is a necessary replacement to uncontrolled wildland fires because of threats to human habitation. Development patterns in rural lands can reduce the ability to manage fuel and defend "values at risk".

Geographic Area

Generally, there are three major factors that sustain wildfires and predict a given area's potential to burn. These factors are fuel, topography, and weather.

- **Fuel**—Fuel is the material that feeds a fire and is a key factor in wildfire behavior. Fuel is generally classified by type and by volume. Fuel sources are diverse and include everything from dead tree leaves, twigs, and branches to dead standing trees, live trees, brush, and cured grasses. Also, to be considered as a fuel source are manmade structures, such as homes and other associated combustibles. The type of prevalent fuel directly influences the behavior of wildfire. Fuel is the only factor that can be modified by humans. Fuel types within San Luis Obispo County are described in Table 5-111 below.
- **Topography**—An area's terrain and slopes affect its susceptibility to wildfire spread. Both fire intensity and rate of spread increase as slope increases due to the tendency of heat from a fire to rise via convection. The arrangement and types of vegetation throughout a hillside can also contribute to increased fire activity on slopes.

- Weather—Weather components such as temperature, relative humidity, wind, and lightning also affect the potential for wildfire. High temperatures and low relative humidity dry out fuels that feed wildfires, creating a situation where fuel will more readily ignite and burn more intensely. Thus, during periods of drought, the threat of wildfire increases. Wind is the most influential weather factor of the three and its influence can increase rates of spread regardless of temperature and relative humidity.

The areas within the county that are subject to increased wildfire risks are generally those communities where urban development abuts non-maintained wildland fuels, resulting in a wildland-urban interface (WUI). When residential development occurs within or adjacent to an area that has a high wildfire hazard severity, the ability of fire fighting forces to combat a fire may also be impaired. When residences are located in the vicinity of wildfire, typical firefighting techniques, such as the use of backfires, may not be feasible. Additionally, firefighting equipment and personnel may be used for structure protection, instead of being used to fight the fire. This results in the need for additional equipment to effectively minimize structural losses and to control the fire.

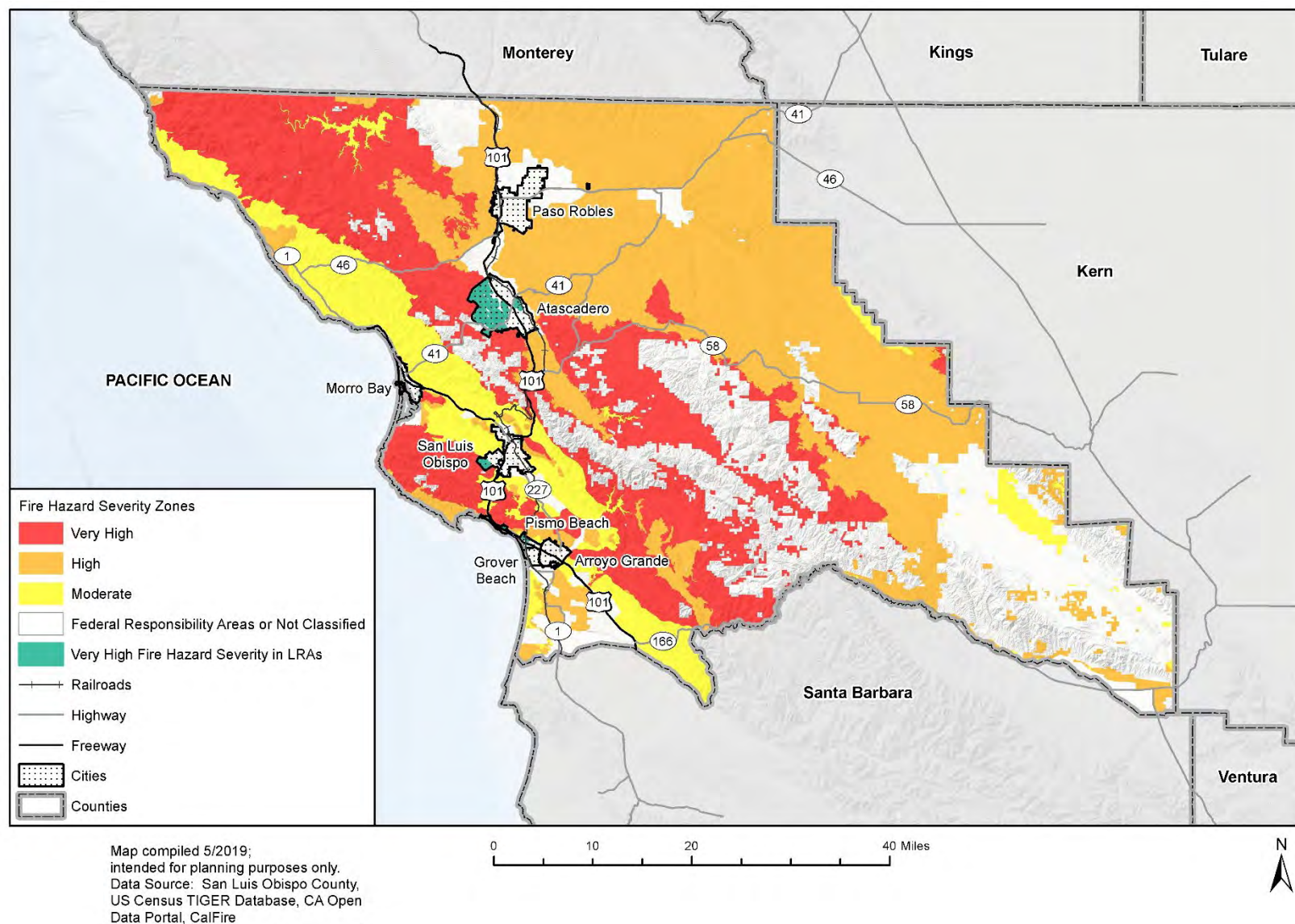
CAL FIRE identifies areas that are at high risk of damage from wildfire based primarily on three factors:

- Ranking Fuel Hazards = ranking vegetation types by their potential fire behavior during a wildfire.
- Assessing the Probability of Fire = the annual likelihood that a large damaging wildfire would occur in a particular vegetation type.
- Defining Areas of Suitable Housing Density that Would Create Wildland-Urban Interface Fire Protection Strategy Situations = areas of intermingled wildland fuels and urban environments that are in the vicinity of fire threats.

Population density and the presence of structures are not currently used to determine the fire hazard severity for a particular region, although they do have a significant impact on fire behavior.

Based on the above criteria, CAL FIRE has mapped Fire Hazard Severity Zones throughout the county designated as "Very High," "High," or "Moderate" as shown below in Figure 5-80. In San Luis Obispo County, most of the area that has been designated as a "Very High Fire Hazard Severity Zone" is located in the Santa Lucia Mountains, which extends from Monterey County to the north, to Santa Barbara County to the south. These areas exhibit the combination of vegetative fuel, topography, and human proximity that contribute to an extreme fire hazard potential. The fact that an area is in a Moderate Hazard designation does not mean it cannot experience a damaging fire. It only means that the probability is reduced, generally because the number of days a year that the area has "fire weather" is less.

Figure 5-80 Fire Hazard Severity Zones in State & Local Responsibility Areas



CAL FIRE has also designated the following San Luis Obispo County communities as being at increased risk from wildfires (http://osfm.fire.ca.gov/fireplan/fireplanning_communities_at_risk):

- Adelaida
- Arroyo Grande, City of
- Atascadero, City of
- Avila Beach
- Baywood-Los Osos
- Cambria
- Cayucos
- Creston
- Grover Beach, City of
- Lake Nacimiento
- Morro Bay, City of
- Nipomo
- Oceano
- Paso Robles, City of
- Pismo Beach, City of
- San Luis Obispo, City of
- San Miguel
- Santa Margarita
- Templeton

Some unincorporated communities located within the county are not confronted with a high wildfire risk, due primarily to the dominant type of vegetation in those areas. The low-growing native grasses and shrubs found in these communities present a minimal vegetative fuel source and a corresponding low wildfire risk. In the Arroyo Grande and Grover Beach areas, mild coastal summers characterized by cool temperatures and foggy days and nights help to maintain the fuel moisture levels to a point that limits the potential for rapid fire spread. In addition, the topography of those areas is mainly level and well developed in both residential and agricultural land uses.

Extent (Magnitude/Severity)

Vegetation (or fuel) plays a major role in fire behavior and shaping fire hazard potential. Vegetation distribution throughout the county varies by location and topography, with dramatic differences observed between the eastern, agricultural and ranching portions of the county, and the more mountainous central and southern regions. Land cover distribution within the county can be classified into 14 different fuel models, as presented in Table 5-111. The most abundant vegetative cover within San Luis Obispo County is herbaceous (46.9%), or annual grassland, distributed primarily in the inland valley and plain areas east of the La Panza, Garcia, and Santa Lucia Ranges. While this fuel type can burn quickly under strong, dry wind patterns, it does not produce the high heat intensity and high flame lengths associated with scrub, chaparral, and forest fuel types. Other significant vegetative cover types include: light brush (16.5%), pine/grass (12.1%), and hardwood/conifer litter (8.3%). These vegetation types are primarily associated with the steeper, upland areas in the La Panza, Garcia, and Santa Lucia Ranges throughout the central portion of the county. Fire behavior in brush fuel types produces higher flame lengths than that in grassland, although spread rates are typically slower. Fire behavior in forests is variable, depending on surface fuel conditions and the presence of ladder fuels.

Table 5-111 Fuel Model Types in San Luis Obispo County

Fuel Model Number	Description	Approximate Acreage	Percent Cover
1	Grass	997,984	46.98%
5	Light Brush	349,780	16.46%
2	Pine/Grass	256,610	12.08%
97	Agriculture	220,097	10.36%
8	Hardwood/Conifer Litter	176,008	8.29%
4	Tall Chaparral	88,290	4.16%
28	Urban	19,687	0.93%
10	Heavy Conifer Litter w/ Understory	9,630	0.45%

Fuel Model Number	Description	Approximate Acreage	Percent Cover
6	Intermediate Brush	3,103	0.15%
98	Water	1,726	0.08%
15	Desert	545	0.03%
9	Medium Conifer	242	0.01%
12	Medium Slash	228	0.01%

Source: FRAP

Fuel loading in developed areas susceptible to wildfire becomes even more complex. The introduction of some ornamental plantings as landscaping and groundcover can dramatically increase the fire loading of a neighborhood. Gazebos, fencing, patios, decks and even the structures themselves add even more fuel. Once structures become involved in fire, the problem compounds as embers cast out thousands of feet onto combustible roofs well removed from the wildland area.

Steep terrain also plays a key role in the rate at which wildfires spread, as fires will normally burn much faster uphill. Generally, when the gradient of a slope doubles, the rate of spread of a fire will also double. Steep topography also channels air flow, thereby creating erratic wind patterns. Fire suppression in steep areas is also complicated by limited accessibility, and the effectiveness of firefighters and equipment are hampered by lack of access roads.

Another factor that can increase the severity of wildfires in the county is areas with high percentages of dead trees, as discussed in subsection 5.3.5 on Agricultural Pest Infestation and Plant Disease.

The Fire Rating System defined in Table 5-112 describes the characteristics and potential intensity of fires, including the effect on the ability to manage and suppress fires. Fire conditions up through Class 5 are possible in San Luis Obispo County, primarily in the unincorporated areas.

Table 5-112 Fire Danger Rating System

Rating	Basic Description	Detailed Description
CLASS 1: Low Danger (L) COLOR CODE: Green	fires not easily started	Fuels do not ignite readily from small firebrands. Fires in open or cured grassland may burn freely a few hours after rain, but wood fires spread slowly by creeping or smoldering and burn in irregular fingers. There is little danger of spotting.
CLASS 2: Moderate Danger (M) COLOR CODE: Blue	fires start easily and spread at a moderate rate	Fires can start from most accidental causes. Fires in open cured grassland will burn briskly and spread rapidly on windy days. Woods fires spread slowly to moderately fast. The average fire is of moderate intensity, although heavy concentrations of fuel – especially draped fuel -- may burn hot. Short-distance spotting may occur but is not persistent. Fires are not likely to become serious and control is relatively easy.
CLASS 3: High Danger (H) COLOR CODE: Yellow	fires start easily and spread at a rapid rate	All fine dead fuels ignite readily, and fires start easily from most causes. Unattended brush and campfires are likely to escape. Fires spread rapidly, and short-distance spotting is common. High intensity burning may develop on slopes or in concentrations of fine fuel. Fires may become serious and their control difficult, unless they are hit hard and fast while small.
CLASS 4: Very High Danger (VH) COLOR CODE: Orange	fires start very easily and spread at a very fast rate	Fires start easily from all causes and immediately after ignition, spread rapidly and increase quickly in intensity. Spot fires are a constant danger. Fires burning in light fuels may quickly develop high-intensity characteristics - such as long-distance spotting - and fire whirlwinds, when they burn into heavier fuels. Direct attack at the head of such fires is rarely possible after they have been burning more than a few minutes.

Rating	Basic Description	Detailed Description
CLASS 5: Extreme (E) COLOR CODE: Red	fire situation is explosive and can result in extensive property damage	Fires under extreme conditions start quickly, spread furiously and burn intensely. All fires are potentially serious. Development into high-intensity burning will usually be faster and occur from smaller fires than in the Very High Danger class (4). Direct attack is rarely possible and may be dangerous, except immediately after ignition. Fires that develop headway in heavy slash or in conifer stands may be unmanageable while the extreme burning condition lasts. Under these conditions, the only effective and safe control action is on the flanks, until the weather changes or the fuel supply lessens.

Source: <http://www.wfas.net>

Major wildland fires can completely destroy ground cover. If heavy rains follow a major fire, flash floods, heavy erosion, land subsidence and mudflows can occur. After a wildland fire passes through an area, the land is laid bare of its protective vegetation cover and is susceptible to excessive run-off and erosion from winter storms. The intense heat from the fire can also cause a chemical reaction in the soil that makes it less porous, and the fire can destroy the root systems of shrubs and grasses that aid in stabilizing slope material. These cascading effects can have ruinous impacts on people, structures, infrastructure, and agriculture.

For more details on the extent and expected behavior of fires in the county see the March 2019 San Luis Obispo County Community Wildfire Protection Plan (CWPP).

Previous Occurrences

490 wildfires have been recorded in San Luis Obispo County between 1900 and 2018, as shown in Figure 2 below. This equates to an average of around four wildfires per year. Most of these fires burned from a few hundred to a few thousand acres; the median acreage burned in those 490 wildfires is 277 acres, while the mean acreage burned is 2,554 acres due to several large fires driving up the average.

Figure 5-81 Fire History in San Luis Obispo County from 1900 to 2018

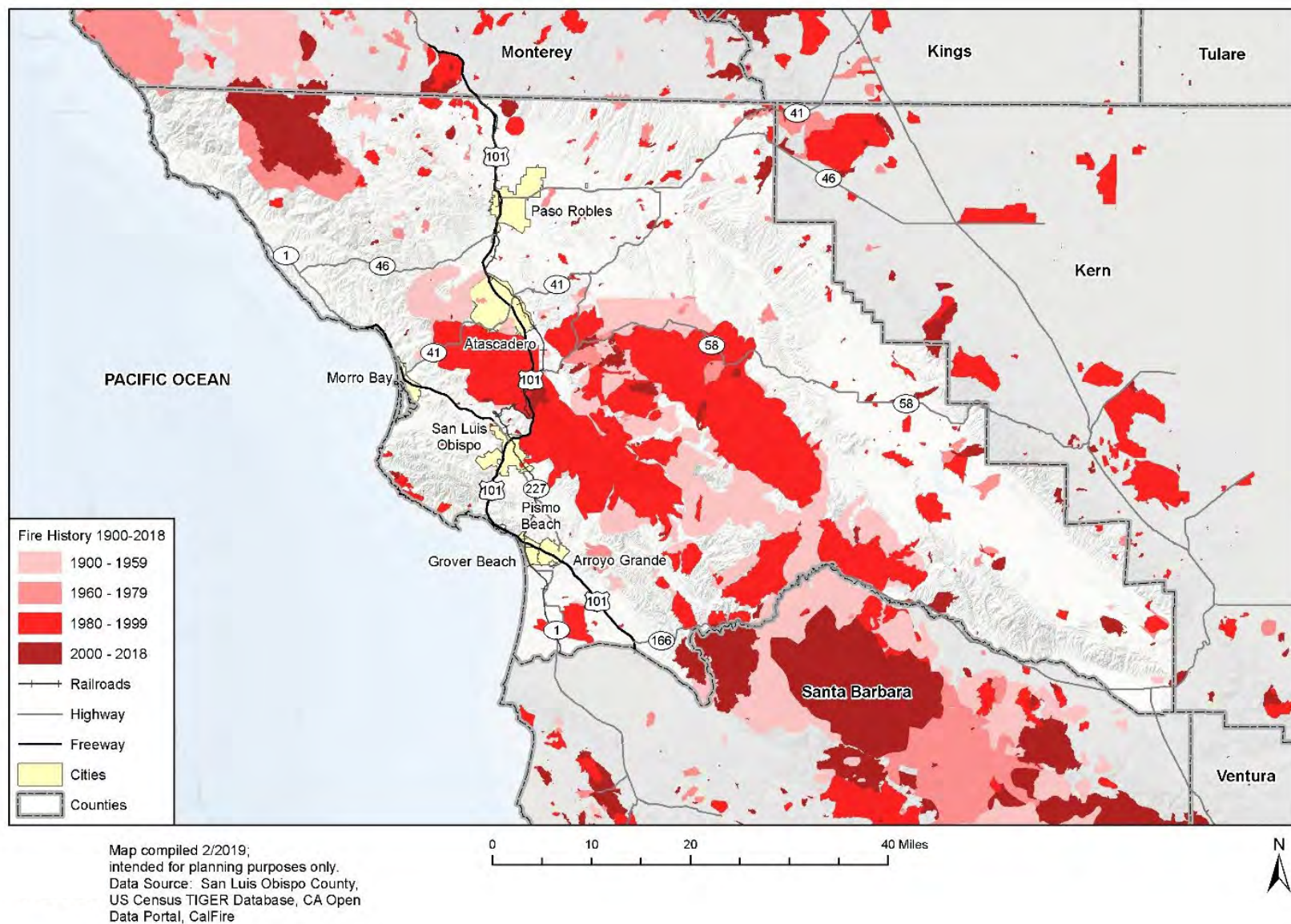
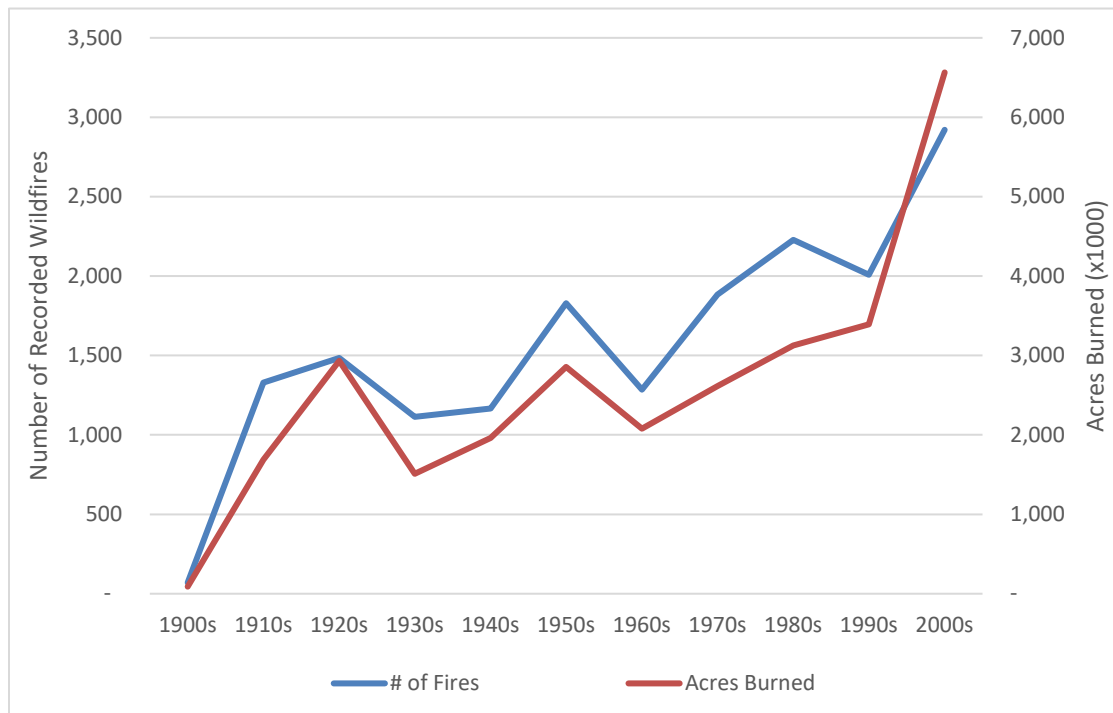


Figure 5-82 plots the number of fires in San Luis Obispo County by decade along with the total acreage burned by those fires. The lower number of fires in earlier decades may be at least in part due to less rigorous record-keeping. Nevertheless, a trend toward more wildfires and more acres burned is clearly visible.

Figure 5-82 Fire History by Decade in San Luis Obispo County from 1900 to 2010



Source: FRAP. Analysis by Wood

While the majority of the past wildfires had relatively minor impacts, the county also has a history of damaging wildfires, with 15 fires burning more than 20,000 acres each since 1900, as shown in Table 5-113.

Table 5-113 Large Fire History (Fires Greater Than 20,000 Acres)

Fire Name	Year	Approx. Acres Burned	Damages
Avenal's Fire	1917	21,242	Unknown
Unnamed Fire	1921	63,909	Unknown
Unnamed Fire	1922	25,637	Unknown
Machesna Fire	1939	28,313	Unknown
Pilitas #1 Fire	1950	22,844	Unknown
Sam Jones Fire	1953	35,455	Unknown
Big Dalton Fire	1953	67,701	Unknown
Weferling Fire	1960	51,451	Unknown
Buckeye Fire	1970	42,307	Unknown
Las Pilitas Fire	1985	84,271	Destroyed 10 homes
Highway 41 Fire	1994	50,729	Destroyed 42 homes, 61 other structures, and 91 vehicles
Highway 58 Fire	1996	106,969	Destroyed 13 homes, numerous other structures & vehicles
Logan Fire	1997	49,490	None (remote, unpopulated area)

Fire Name	Year	Approx. Acres Burned	Damages
Chimney Fire	2016	46,344	Destroyed 49 homes and 21 other structures
Alamo Fire	2017	28,834	Destroyed one home and 13 other structures

Source: FRAP

An analysis of 457 fire starts in the county from 2013 to 2017 where the cause of the fire could be determined found that powerlines and vehicle or equipment use accounted for 70% of ignitions.

Table 5-114 Ignition History in San Luis Obispo County, 2013-2017

Ignition Cause	Number	Percentage
Powerline/Vehicle/Equipment Use	319	70%
Debris Burning	46	10%
Campfire	35	8%
Arson	31	7%
Lightning	10	2%
Smoking	9	2%
Playing w/ Fire	7	2%

Source: SRA Ignition History for San Luis Obispo County (2013-2017)

Probability of Future Occurrences

Likely. Based on the historical record, San Luis Obispo County can expect multiple small wildfires most years, with a large (20,000+ acre) damaging wildfire every 7-8 years. The interval between large damaging wildfires varies from as long as 17 years to as short as 1 year.

Climate Change Considerations

Growing amounts of greenhouse gases coupled with population growth and development are expected to continue impacting California forests and natural resources. Likewise, the effects of climate change have the potential to impact wildfire behavior, the frequency of ignitions, fire management, and fuel loads. Increasing temperatures may intensify wildfire threat and susceptibility to more frequent wildfires in the county.

Exactly how climate change will affect total precipitation is not clear, but models suggest that there is a tendency for wetter conditions in the northern part of the state and drier conditions in the south (California Natural Resources Agency 2018a). Forests are also sensitive to variable precipitation events, as the 2012-2017 drought contributed to widespread tree mortality as warmer temperatures stressed trees and made them more susceptible to pests and pathogens (California Natural Resources Agency 2018). Studies noted in California's Fourth Assessment report note climate change impacts on wind patterns may strongly affect forests, potentially serving as a trigger mechanism for conversion of forest to other types of vegetation (California Natural Resources Agency 2018).

Current scientific models expect California will be affected by increased numbers of forest fires with added intensity due to longer warmer seasons, reduced distribution of biodiversity, lack of moisture, changes in ecosystems, drought impacts (e.g. pest diseases and continued spread of invasive species), and other impacts in coming years. The anticipated growth and development described in Section 4 and also be expected to amplify these effects. As seen with the 2017 -2018 wildfires, more damage occurred in developed areas like Santa Rosa in Sonoma County, Montecito in Santa Barbara County, Paradise in Butte

County, and the Thomas Fire in Ventura & Santa Barbara. The extending of the wildfire season into winter months, coinciding with seasonal high wind patterns, has contributed to severe fires in recent years. Southern California experienced 29 wildfires in December of 2017 alone, and the deadliest and most destructive fire in California history, the Camp Fire, happened in November of 2018.

Vulnerability

San Luis Obispo County vulnerability to wildfires is of significant concern, with some areas of the planning area being at greater risk than others as described further in this section. High fuel loads in the planning area along with geographical and topographical features create the potential for both natural and human-caused fires that can result in loss of life and property. These factors, combined with natural weather conditions common to the area, including periods of drought, low relative humidity, and periodic winds, can result in frequent and sometimes catastrophic fires. Even the relatively flat and more urbanized parts of the county are not immune to fire; hot and sometimes windy weather combined with dry vegetation and a denser population can result in an increase in the number of ignitions.

San Luis Obispo County's wildfire vulnerability is increased by development encroaching into forested and annual grassland areas, typically referred to as the wildland-urban interface. The conversion of agricultural areas to urban use can further exacerbate this problem. As development continues throughout the planning area, especially in the interface, the risk and vulnerability to wildfires will likely increase.

General Property

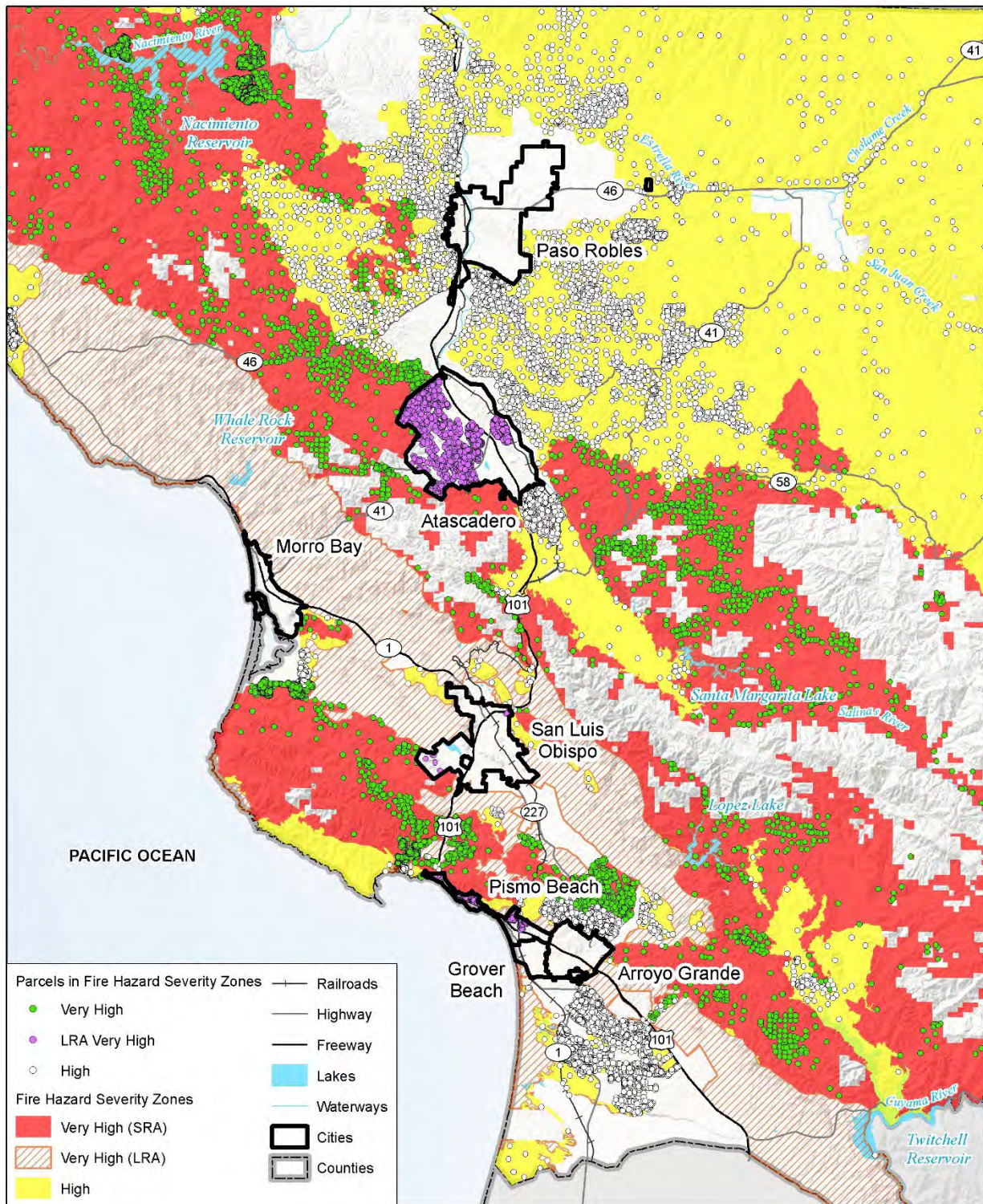
The historical and potential impacts of wildfire on property include crop loss, injury and death of livestock and pets, and damage to infrastructure, homes and other buildings located throughout the wildfire risk area, with greatest potential impact on property, buildings and infrastructure located within high and very high hazard zones including the WUI, and buildings and infrastructure located within forested lands, to include national forests and parks.

The Community Wildfire Threat used in this analysis was derived from the Fire Hazard Severity Zones (FHSZ) spatial dataset, which was explicitly developed for adopting new ignition-resistant building code standards and adopted by the California Building Commission in 2007. It is constructed to describe the nature and probability of fire exposure to structures, including those lands that are highly urbanized, but in close proximity to open wildlands. It is broken into State Responsibility Areas (SRA) and Local Responsibility Areas (LRA). Details of the FHSZ mapping project are available on the FRAP website (<http://frap.fire.ca.gov/projects/hazard/fhz.html>).

GIS was used to create a centroid, or point, representing the center of each parcel polygon, which was overlaid on the FHSZ wildfire layer. For the purposes of this analysis, the wildfire hazard zone that intersected the centroid was assigned as the hazard zone for the entire parcel. For purposes of this analysis, it was assumed that every parcel with an improved value greater than zero was developed in some way, thus only improved parcels and their values were analyzed. The Fire Hazard Severity Zones for the SRA and Very High zones in the LRA were analyzed. The county's parcel layer was used as the basis for the inventory of developed parcels. The results are summarized in the map and tables that follow.

Figure 5-83 illustrates the extent of the problem by showing all parcels with improved values above \$0, as well as government/utility facilities, that are located within Fire Hazard Severity Zones.

Figure 5-83 Improved Parcels by Fire Hazard Severity Zones



Map compiled 3/2019;
intended for planning purposes only.
Data Source: San Luis Obispo County,
US Census TIGER Database, CA Open
Data Portal, CalFire, ParcelQuest

0 10 20 Miles



An analysis of the value of those parcels – the improvement value plus estimated value of building contents – quantifies the potential losses from wildfires by severity zones. The results show that nearly \$10 billion worth of developed parcels are exposed in the High and Very High Severity zones, with \$3.6 billion just in the Very High Severity zone. Residential properties constitute more than half of both the number of parcels and the projected losses. The communities with the greatest exposure are the unincorporated areas, Atascadero, and Pismo Beach. The total values shown in these tables include both structure value and contents and can be used as an estimate of potential losses since wildfires typically result in a total loss. More detailed information on the types and value of properties exposed to wildfire risk can be found in Appendix E.

Table 5-115 Wildfire Hazard Exposure – General Property Summary by Jurisdiction

Jurisdiction	Moderate Severity (SRA)			High & Very High Severity (SRA & LRA)		
	Properties	Total Value	Population	Properties	Total Value	Population
Arroyo Grande	5	\$2,338,635	8	6	\$1,007,592	10
Atascadero	-	-	-	1,594	\$611,221,404	3,865
City of San Luis Obispo	6	\$5,113,067	8	17	\$11,933,805	35
Paso Robles	-	-	-	3	\$507,068	5
Pismo Beach	-	-	-	1,068	\$501,552,519	2,445
Unincorporated	2945	\$1,575,500,560	5,023	20,235	\$8,795,910,655	43,310
Total	2,956	\$1,582,952,262	5,038	22,923	\$9,922,133,042	49,670

Source: San Luis Obispo County Planning & Building/GIS Dept., HIFLD, CalFire, Wood GIS analysis

Table 5- 116 Wildfire Hazard Exposure –Property Summary by Type in High and Very High Potential

Jurisdiction	Moderate Severity (SRA)			High & Very High Severity (SRA & LRA)		
	Properties	Total Value	Population	Properties	Total Value	Population
Agricultural	125	\$143,496,376	-	310	\$534,438,864	-
Commercial	28	\$26,907,204	-	165	\$128,682,700	-
Government/Utilities	321	\$622,953	-	486	\$5,951,421	-
Other/Exempt/Misc.	335	\$44,838,322	-	926	\$76,669,478	-
Residential	1,607	\$1,116,195,564	4,034	17,198	\$8,189,242,350	43,167
Multi-Family Residential	242	\$76,914,723	607	546	\$182,853,743	1,370
Mobile/Manufactured Homes	126	\$34,213,590	316	1,953	\$365,563,895	4,902
Residential: Other	32	\$83,551,748	80	92	\$135,227,636	231
Industrial	6	\$33,657,318	-	11	\$11,751,548	-
Vacant	134	\$22,554,465	-	1,236	\$291,751,409	-
TOTAL	2,956	\$1,582,952,262	5,038	22,923	\$9,922,133,042	49,670

Source: San Luis Obispo County Planning & Building/GIS Dept., HIFLD, CalFire, Wood GIS analysis



People

Wildland fires result in a high risk for personal injury, loss of life to inhabitants of the fire area and firefighters, and losses of structures and personal property. Wildfires in or near the WUI frequently require emergency evacuation and sheltering, often for many days. As is shown in Tables 5-115 and 5-116 above, 49,670 are estimated to live in High or Very High hazard zones.

The data and mapping shown above enables analysis of each jurisdiction's vulnerability in terms of population and density relative to its risk zone. Population density can also change based on time of day and time of year. For example, the population at California Polytechnic State University, San Luis Obispo (Cal Poly) increases during the academic year, and during daytime hours. The potential for extended power outages as a result of a wildfire event will also have impacts on healthcare facilities and medically vulnerable individuals who are dependent on power for medical assessments and treatments. Other at-risk populations include wildland recreational areas such as state and national parks and forests where persons might be located during a wildfire event, particularly during summer months.

Social Vulnerability

As shown in Figure 5-80, the highest wildfire hazard severity zones are found north of Grover Beach, east of Nipomo, west of the City of San Luis Obispo, and some near and west of Paso Robles and San Miguel, which happen to be also highest in terms of overall social vulnerability ranking based on the SoVI data presented and discussed in subsection 4.4.1. Other areas of particular concern include Atascadero, Los Osos, and San Simeon, which rank medium-high on the vulnerability scale but are exposed to great wildfire hazard based on potential severity.

Critical Facilities and Infrastructure

Critical facilities are those community components that are most needed to withstand the impacts of disaster, as previously described in the Assets section. Wildfire impacts to critical facilities can include structural damage or destruction, risk to persons located within facilities, and interruption of facility operations and critical functions.

Wood timber bridges are particularly vulnerable to fire. GIS analysis shows that 10 wood timber bridges in the county potentially at risk to wildfires. In addition, six of these bridges have been rated as being in scour-critical conditions, which makes them even more vulnerable to failure or destruction during a post-fire flood or debris flow event. The table below summarizes how many bridges are at risk of which type of wildfire hazard zone and includes the total of scour-critical status bridges. Further details on the bridges at risk are found in Appendix E.

Table 5-117 Bridges in Wildfire Hazard Zones in San Luis Obispo County

Wildfire Hazard Zone	Total Bridges in Zone	Scour Critical Total
Moderate	6	4
High	2	1
Very High	2	1
TOTAL	10	6

Source: National Bridge Inventory, CalFire, Wood GIS analysis

Table 5-118 and Table 5-119 summarize the number and types of critical facilities found to be at risk of wildfires. These results were found by performing overlay analysis of the critical facilities and the wildfire hazard zone layers in GIS. Most of these facilities at risk are found in unincorporated portions of the county, with a few in Atascadero, Paso Robles, Pismo Beach, and the City of San Luis Obispo. Overall, a total of 348 critical facilities are found within wildfire hazard zones across the county, and most of these in high or very high hazard zones. The majority of these facilities are communications towers, notably microwave service towers, and energy commission facilities. Also, of note are vulnerable population facilities including schools, day care facilities, and a nursing home (in Atascadero). Details on the specific properties at risk are found in Appendix E.

Table 5-118 Critical Facilities in Wildfire Hazard Zones in San Luis Obispo County, by Jurisdiction

Jurisdiction	Count
Atascadero	3
Paso Robles	2
Pismo Beach	2
San Luis Obispo	1
Unincorporated	340
TOTAL	348

Source: San Luis Obispo County Planning & Building/GIS Dept., HIFLD, CalFire, San Luis Obispo County Community Services Districts, Wood GIS analysis

Table 5-119 Critical Facilities in Wildfire Hazard Zones in San Luis Obispo County, by Wildfire Zone

Wildfire Hazard Zone	Count
Moderate	109
High	121
Very High	118
TOTAL	348

Source: San Luis Obispo County Planning & Building/GIS Dept., HIFLD, CalFire, San Luis Obispo County Community Services Districts, Wood GIS analysis

Economy

The economic impacts of wildfire include loss of property, direct agricultural sector job loss, secondary economic losses to businesses in or near wildland resources like parks and national forests, and loss of public access to recreational resources. Fire suppression may also require increased cost to local and state government for water acquisition and delivery, especially during periods of drought when water resources are scarce.

Effects on agriculture can be significant. In addition to the obvious impacts on crops and animals, wildland fire can have damaging effects on soil and water that will impact agriculture for an extended period of time.

Historic, Cultural, and Natural Resources

GIS analysis indicates that 64 historic properties are potentially at risk to wildfires; 51 are located in the High or Very High Severity Zones. Details on the specific properties at risk are found in Appendix E.

San Luis Obispo County also has substantial natural resources potentially at risk from wildfires. As noted earlier, fire is an important natural component of the ecosystem, and wildlands need to burn periodically to naturally maintain viable environments. However, wildfires can have negative impacts on natural resources such as forests, and wildlife habitats. In addition to damaging critical watersheds, post-fire runoff can pollute waterways further impacting water supplies.

Natural resources are important to include in benefit-cost analyses for future projects and may be used to leverage additional funding for mitigation projects that also contribute to community goals for protecting natural resources. Awareness of natural assets can lead to opportunities for meeting multiple objectives. For instance, protecting watersheds will help maintain the quantity and quality of water, timber production and promote carbon sequestration.

Future Development

Large, destructive fires continue to plague California communities including San Luis Obispo County. Research points out that such impacts are closely related to growth and land-use development, particularly development in the WUI. Out of 5,003 building permits issued in San Luis Obispo County between 2014 and 2019, 15% (737) were for construction in the Very High severity zones, and another 30% (1,516) were within the High severity zone. Additional growth and development in areas of fire risk will continue to increase the exposure of the planning area to damaging wildfires.

Risk Summary

The overall significance of wildfire in San Luis Obispo County is High. These events are recurring in nature and can cause significant damage, loss of life, and disruption to critical infrastructure.

- The Wildfire hazard severity of most of the county is rated as Moderate, High, or Very High.
- The county experiences several relatively smaller wildfires per year, with a major damaging fire every 7-8 years. The last several decades have seen a continual increase in the number of fires and acreage burned per year.
- Powerlines and vehicle or equipment use account for 70% of ignitions where the cause of the fire can be determined.
- *Effects on people:* Past wildfires in the county have not resulted in a large number of fatalities; however, significant evacuation and sheltering are frequently required.
- *Effects on property:* Wildfires can destroy homes, businesses, and critical infrastructure. Nearly \$10 billion dollars' worth of property is at Very High or High exposure to wildfire threat.
- *Effects on economy:* Wildfires impacts can include loss of property, direct agricultural sector job loss, secondary economic losses to businesses, and loss of public access to recreational resources.
- *Effects on critical facilities and infrastructure:* Wildfires can disrupt access to, or even destroy critical facilities and infrastructure. Based on GIS analysis of the critical facilities and infrastructure, there are a total of 348 of them found within moderate, high, or very high wildfire hazard zones, with most of those facilities in the unincorporated portions of the county. A total of 6 critical scour-condition bridges were found to be in wildfire hazard zones.
- *Related Hazards:* Drought, Agricultural Pest Infestation and Plant Disease, Landslide and Debris Flow



Table 5-120 Wildfire Risk Summary

Jurisdiction	Geographic Extent	Probability of Future Occurrence	Magnitude/Severity	Overall Significance
San Luis Obispo County	Extensive	Likely	Critical	High
City of Arroyo Grande	Significant	Occasional	Limited	Medium
City of Atascadero	Extensive	Likely	Critical	High
City of Grover Beach	Limited	Occasional	Limited	Low
City of Morro Bay	Extensive	Highly Likely	Catastrophic	High
City of Paso Robles	Extensive	Highly Likely	Critical	High
City of Pismo Beach	Significant	Occasional	Critical	Medium
City of San Luis Obispo	Significant	Occasional	Limited	Medium
Avila Beach CSD	Significant	Likely	Limited	High
Ground Squirrel Hollow CSD	Extensive	Occasional	Critical	High
Heritage Ranch CSD	Extensive	Likely	Catastrophic	High
Los Osos CSD	Significant	Likely	Limited	High
Nipomo CSD	Significant	Occasional	Limited	Medium
San Miguel CSD	Extensive	Highly Likely	Catastrophic	High
San Simeon CSD	Significant	Likely	Catastrophic	High
Templeton CSD	Significant	Likely	Limited	Medium
Cayucos Sanitary District	Significant	Occasional	Limited	Medium
Port San Luis Harbor District	Significant	Occasional	Critical	Medium
San Luis Obispo FCWCD	Extensive	Likely	Critical	High
South San Luis Obispo Sanitary District	Significant	Occasional	Limited	Low



5.3.16 Hazardous Materials Incidents

Hazard/Problem Definition

Generally, a hazardous material is a substance or combination of substances which, because of quantity, concentration, or physical, chemical, or infectious characteristics, may either cause or significantly contribute to, an increase in mortality or an increase in serious, irreversible, or incapacitating reversible, illness. Hazardous materials may also pose a substantial present or potential hazard to human health or environment when improperly treated, stored, transported, disposed of, or otherwise managed. Hazardous material incidents can occur while a hazardous substance is stored at a fixed facility, or while the substance is being transported along a road corridor or railroad line or via an enclosed pipeline or other linear infrastructure.

The U.S. Department of Transportation (DOT), U.S. Environmental Protection Agency (EPA) and the Occupational Safety and Health Administration (OSHA) all have responsibilities relating to the transportation, storage, and use of hazardous materials and waste. The Right to Know Network (RTK NET), maintained by the EPA's National Response Center (NRC), is a primary source of information on the use and storage of hazardous materials, as well as data regarding spills and releases. The California Environmental Protection Agency (CalEPA) and Department of Toxic Substances Control (DTSC) are authorized by the U.S. EPA to enforce and implement federal hazardous materials laws and regulations within the state. At the local level, San Luis Obispo County's Environmental Health Department is the approved CUPA responsible for administration of permitting, inspections, and enforcement for hazardous waste and hazardous materials programs. The CUPA administers the Hazardous Material Business Plan (HMBPs), California Accidental Release Prevention (Cal-ARP) program, and the Aboveground Storage Act, as well as permitting and inspection activities for hazardous waste generators, and onsite hazardous waste treatment facilities, and underground storage tanks.

Hazardous materials can be divided into the following classes:

- Explosives
- Compressed gases: flammable, non-flammable compressed, poisonous
- Flammable liquids: flammable (flashpoint below 141 degrees Fahrenheit), combustible (flashpoint from 141 - 200 degrees)
- Flammable solids: spontaneously combustible, dangerous when wet
- Oxidizers and organic peroxides
- Toxic materials: poisonous material, infectious agents
- Radioactive material
- Corrosive material: destruction of human skin, corrodes steel

It is also common to see hazardous materials releases as escalating incidents resulting from other hazards such as floods, wildfires, and earthquakes. The release of hazardous materials can greatly complicate or even eclipse the response to the natural hazards disaster that caused the spill.

The Safety Element of the San Luis Obispo County General Plan contains goals, policies, and implementation measures pertaining to hazardous materials, including radioactive materials and pesticides.

Geographic Area

Hazmat incidents can occur at a fixed facility or during transportation. Table 5-121 breaks down 1803 hazardous materials incidents reported to the California Office of Emergency Services (Cal OES) Warning Center from 1994 through October 24, 2018 based on location. These incidents include both transportation and fixed-facility incidents. This list in no way captures all hazardous material spills within the county, only those that were significant enough to be reported to Cal OES. The data indicates that hazardous materials incidents can occur across the county with a greater frequency in the more developed areas.

Table 5-121 Hazardous Materials Incidents in San Luis Obispo County by Jurisdiction, 1994-2018

Jurisdiction	Incidents	Jurisdiction	Incidents
San Luis Obispo City	419	Los Osos	17
Morro Bay	266	Shandon	15
Unincorporated County	209	Pozo	13
Arroyo Grande	161	San Miguel	6
Paso Robles	123	Creston	5
Avila Beach	97	Shell Beach	5
Atascadero	89	Cholame	3
Cambria	62	Cuyuma	2
Nipomo	58	New Cuyuma	2
Pismo Beach	54	Santa Maria	2
Santa Margarita	40	Baywood Park	1
San Simeon	38	Bradley	1
Templeton	26	California Valley	1
Cayucos	24	Camp Roberts	1
Grover Beach	21	Lake Nacimiento	1
Oceano	21	Lockwood	1
Guadalupe	18	Unknown	1

Source: Cal OES Spill Release Reporting (<https://www.caloes.ca.gov/cal-oes-divisions/fire-rescue/hazardous-materials/spill-release-reporting>), analysis by Wood

Fixed Facilities

Hazardous materials facilities are identified and mapped by the counties they are located in, along with the types of materials stored there; facilities generally are located in and around developed areas. The San Luis Obispo County Office of Emergency Services administers the Emergency Planning and Community Right-to-Know program for the planning area. Under Chapter 6.95 of the California Health and Safety Code and the Federal Resource Conservation and Recovery Act (RCRA), any business storing quantities of hazardous materials greater than 55 gallons of liquid, 500 pounds of solid or 200 cubic feet of some compressed gasses must file a HMBP annually that establishes incident prevention measures, hazardous material handling protocols and emergency response and evacuation procedures.

The EPA requires facilities containing certain extremely hazardous substances to generate Risk Management Plans (RMPs) and resubmit these plans every five years. According to the RTK NET, as of April 2019 there are nine RMP facilities located in the county, as shown below in Figure 5-84. These nine

sites store approximately 364,066 pounds of toxic chemicals, primarily ammonia (304,000 pounds), chlorine (56,400 pounds), and anhydrous ammonia (28,166 pounds).

The California Accidental Release Prevention Program (CalARP) is a statewide initiative to reduce the likelihood and severity of consequences of extremely hazardous materials releases. CalARP requires certain facilities (referred to as "stationary sources") which handle specified chemicals (termed "regulated substances") to take specified actions to proactively prevent and prepare for chemical accidents. Because the CalARP program is implemented at the local government level by the CUPAs, they can work directly with regulated facilities. Figure 5-84 shows 17 CalARP-regulated facilities located in San Luis Obispo County, three of which are also RMP facilities.

Additionally, there are several offshore oil and gas drilling platforms to the southwest of Arroyo Grande that have the potential to cause significant oil spills.

Finally, California's only operating nuclear power plant, the Diablo Canyon Nuclear Power Plant, is located in San Luis Obispo County west of Avila Beach. Jurisdictions located in the Emergency Planning Zones (1-12) for the plant include Avila Beach, the City of San Luis Obispo, Los Osos, Arroyo Grande, Grover Beach, Oceano, Pismo Beach, Shell Beach, Morro Bay, and Cayucos; these zones are shown in Figure 5-85 below. Further details on the Emergency Planning Zones, as well as other information on hazards and vulnerabilities pertaining to the Diablo Canyon Power Plant, can be found in the San Luis Obispo County/Cities Nuclear Power Plant Emergency Response Plan. The plant's operator, Pacific Gas & Electric, has announced its intention to close both of Diablo Canyon reactors by 2025; however, the site will remain a hazardous materials site for decades.

Figure 5-84 Significant Hazardous Materials Facilities in San Luis Obispo County

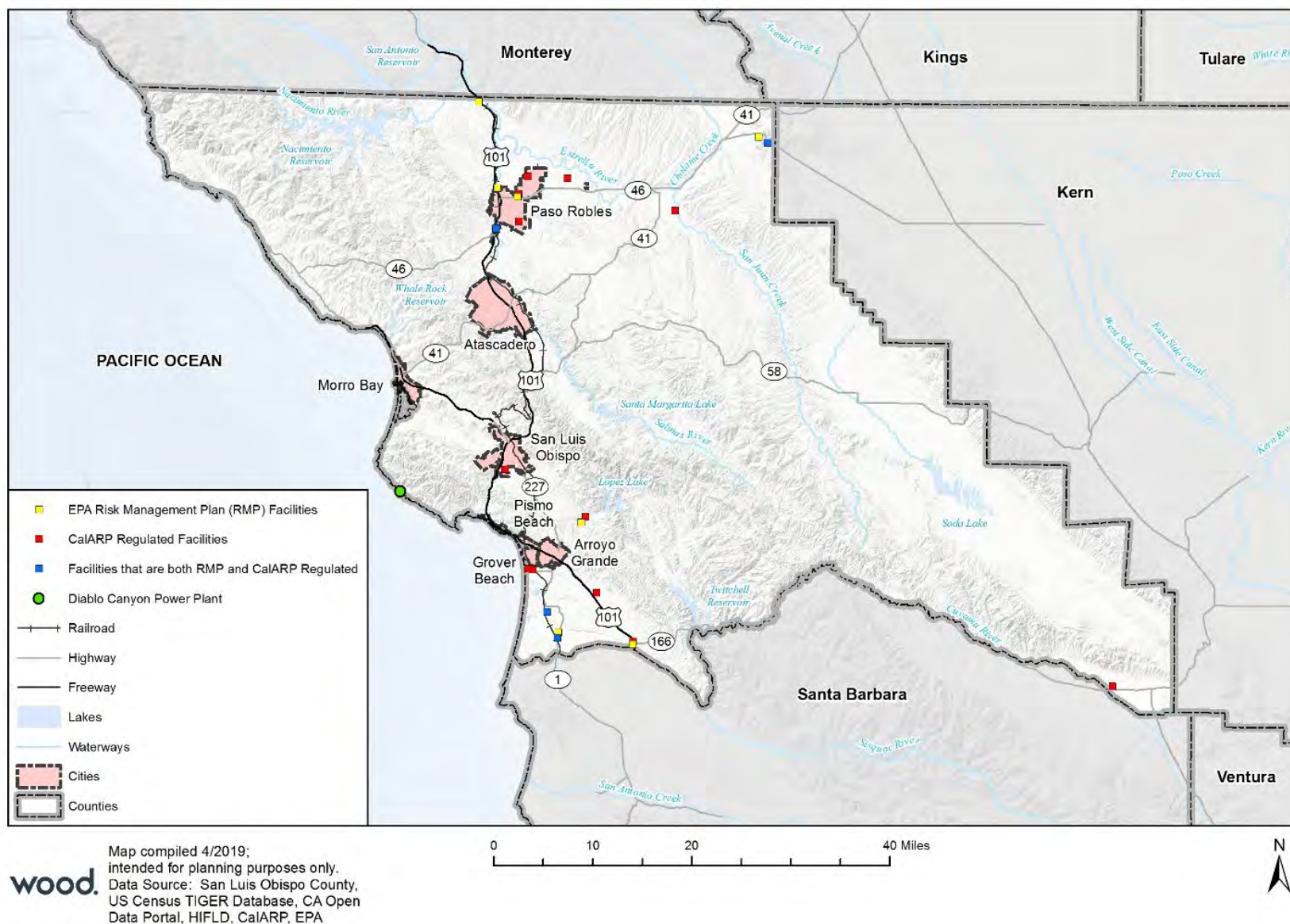


Figure 5-85 Diablo Canyon Nuclear Power Plant Emergency Planning Zones



Source: San Luis Obispo County

Transportation

In transit, hazardous materials generally follow major transportation routes, including road, rail and pipelines, creating a risk area immediately adjacent to these routes. The county's transportation network, primarily U.S. Route 101, and State Highways 1, 46, and 166, all have the potential for hazardous material incidents. Railroad lines and airports may also transport hazardous materials.

Hazardous materials releases can also result from natural disasters, such as floods or earthquakes that may cause containment systems to fail or affect transportation infrastructure. In summary, hazardous material incidents have the potential to occur in business and industrial areas (where fixed facilities are located) and along transportation corridors. Often these facilities are concentrated in the planning area

due to their manufacturing operations. Hazardous material incidents can also occur in agricultural areas; these types of facilities typically use pesticides, fertilizers, and other agricultural chemicals that are harmful to people and the environment. For example, agricultural pesticides and fertilizers are often transported daily around the planning area. Illegal drug operations and dumping sites have also been known to pose a hazardous materials threat.

Lastly, information provided by the National Pipeline Mapping System (NPMS) indicate several pipelines conveying gas or hazardous liquids cross the planning area. Pipelines ruptures can result in major spills, or even explosions like the ones in San Bruno in 2010, and Fresno in 2015. The HMPC noted that high-pressure gas and petroleum pipelines to Kern County cross the San Andreas fault.

Extent (Magnitude/Severity)

Hazardous materials come in the form of explosives, flammable and combustible substances, poisons and radioactive materials. Hazards can occur during production, manufacturing, storage, transportation, use, or disposal. Impacts from hazardous materials releases can include:

- Fatalities
- Injury
- Evacuations
- Property damage
- Animal fatalities (livestock, fish & wildlife)
- Air pollution
- Surface or ground water pollution/contamination
- Interruption of commerce and transportation

Numerous factors influence the impacts of a hazardous materials release, including the type and quantity of material, location of release, method of release, weather conditions, and time of day. This makes it difficult to predict precise impacts. The impact to life and property from any given release depends primarily on:

- The type and quantity of material released.
- The human act(s) or unintended event(s) necessary to cause the hazard to occur.
- The length of time the hazard is present in the area.
- The tendency of a hazard, or that of its effects, to either expand, contract, or remain confined in time, magnitude, and space.
- Characteristics of the location and its physical environment that can either magnify or reduce the effects of a hazard.

CalFire notes several additional factors that can contribute to the impact of hazardous materials releases from a fixed facility or transportation incident:

- Solid, liquid, and/or gaseous hazardous materials can be released from fixed or mobile containers either accidentally or on purpose.
- The resulting release can last for hours or for days.
- The substances released may be corrosive or otherwise damaging over time, and they may cause an explosion and/or fire.
- Contamination may be carried out of the incident area by people, vehicles, water, and/or wind.

- Weather conditions will directly affect how the hazard develops.
- The micrometeorological effects of buildings and terrain can alter travel and duration of agents.
- Shielding in the form of sheltering in place can protect people and property from harmful effects.
- Noncompliance with fire and building codes as well as failure to maintain existing fire protection and containment features can substantially increase the damage from a hazardous materials release.

The release or spill of hazardous materials can also require different emergency responses depending on the amount, type, and location of the spill incident.

As noted above, the county contains a number of facilities that store and use significant quantities of hazardous materials. Additionally, a variety of hazardous materials are transported through the county by highway, rail, and pipelines, all of which are potentially vulnerable to accidental spills. Consequences can vary depending on whether the spill affects a populated area versus an unpopulated but environmentally sensitive area.

Potential losses can vary greatly for hazardous material incidents. For even a small incident, there are cleanup and disposal costs. In a larger scale incident, cleanup can be extensive and protracted. There can be deaths or injuries requiring doctor's visits and hospitalization, disabling chronic injuries, soil and water contamination can occur, necessitating costly remediation. Evacuations can disrupt home and business activities. Large-scale incidents can easily reach \$1 million or more in direct damages, with clean-ups that can last for years.

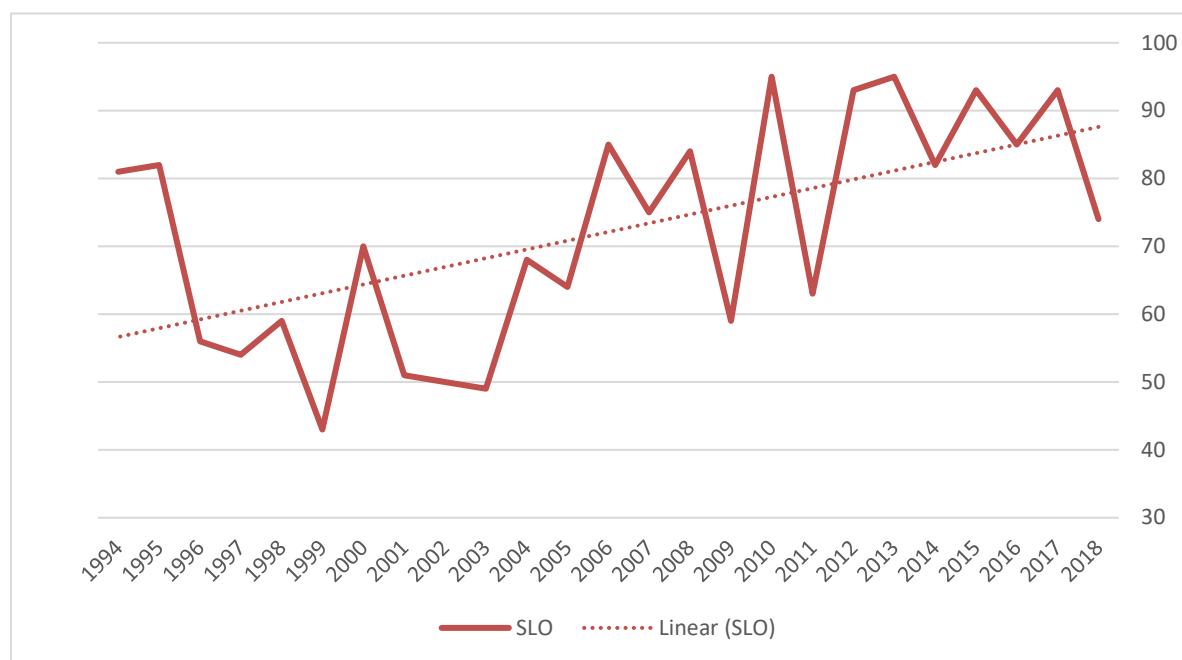
Previous Occurrences

San Luis Obispo County experiences multiple hazardous materials incidents every month. The vast majority of these incidents are minor with very localized impacts. However, the county also has a history of more serious incidents. On August 10, 1986, a train derailment including three tank cars containing 31,000 gallons of liquid isobutane led to a precautionary evacuation of 3,000 people in Grover Beach and Oceano; fortunately, there were no leaks or explosions, and no injuries from the incident. In the 1990s a massive oil spill caused by decades of seepage from corroded oil pipelines was discovered underneath the town of Avila Beach, the cleanup of which generated more than 6,750 truckloads of contaminated material. On October 3, 2001, an anhydrous ammonia leak developed in a refrigeration system that was being dismantled at a fish handling facility just above the harbor; the incident resulted in the temporary evacuation of an estimated 3,000 people for approximately nine hours and generated significant nationwide media attention.

The EPA's Right-to-Know Network (RTK NET) records 726 hazardous materials incidents in San Luis Obispo County reported to the EPA from 1987 through 2018, an average of 22.7 per year. However, only the most serious spills are reported to the EPA. The Cal OES Warning Center reports 1,803 hazardous materials incidents in San Luis Obispo County from 1994 through October 24, 2018; this works out to an average of 72 incidents per year. Even this total likely excludes a large number of unreported minor spills.

Figure 5-86 below shows the number of incidents in San Luis Obispo County reported to Cal OES over the last 25 years. It shows that the number of recorded hazardous materials incidents in the county has increased from an average of fewer than 60 per year in the 1990s to almost 90 in the recent years. This matches hazardous material incidents statewide, which have similarly increased from around 5,000 incidents per year in the 1990s to over 8,000 in recent years.

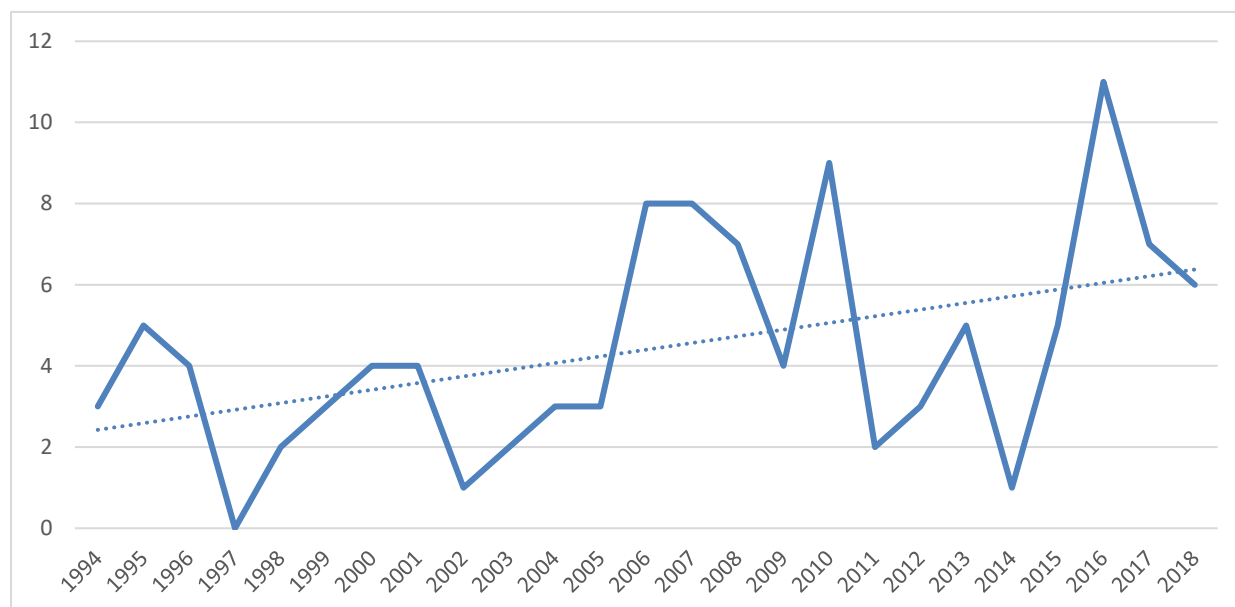
Figure 5-86 Hazardous Materials Incidents in San Luis Obispo County, 1994-2018



Source: Cal OES Spill Release Reporting (<https://www.caloes.ca.gov/cal-oes-divisions/fire-rescue/hazardous-materials/spill-release-reporting>), analysis by Wood

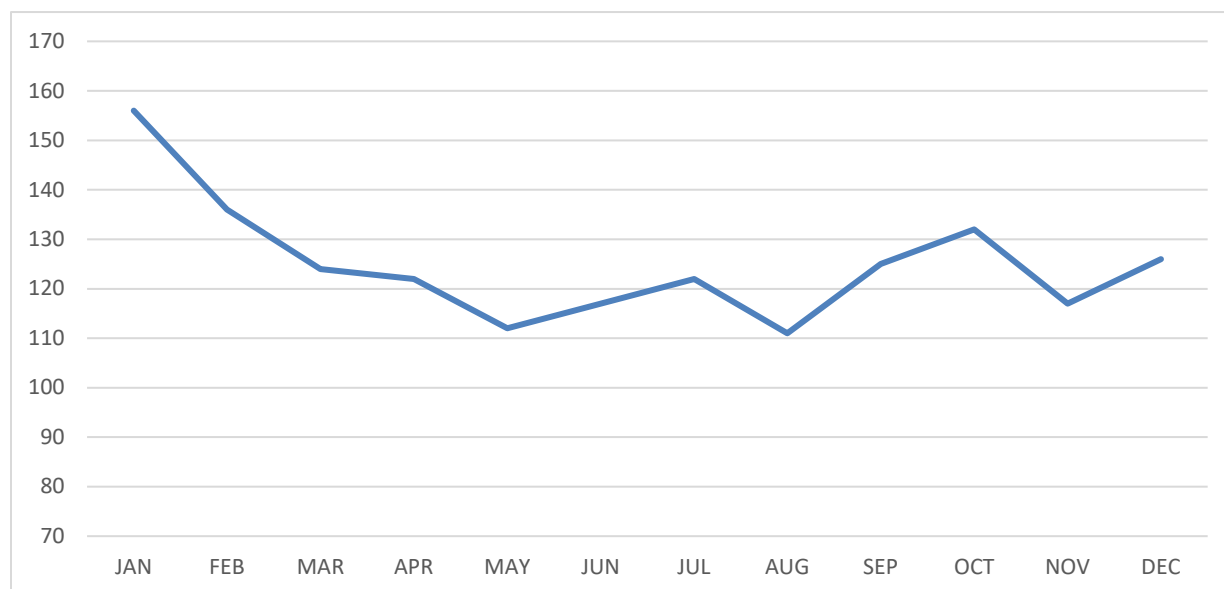
The vast majority of hazardous materials incidents have only minimal life safety impacts. Of the 1,803 incidents Cal OES reports in San Luis Obispo County from 1994 through October 24, 2018, only 110 (6%) result in any injuries, fatalities, or evacuations. This translates to an average of 4.4 damaging hazardous materials incidents per year, although as shown in Figure 5-87 the number of these damaging incidents has increased from 2-3 per year in the late 90s to 5-6 per year more recently. In all, Cal OES records 35 fatalities, 61 injuries, and 30 evacuations associated with those incidents, for an average of 1.4 fatalities, 2.4 injuries, and 1.2 incidents requiring evacuations per year. The number of persons killed or injured in hazardous materials incidents has similarly increased over the last 25 years, from around 3 fatalities/injuries per year in the 1990s to 4.5 today.

Figure 5-87 Hazardous Materials Incidents in San Luis Obispo County Resulting in Injuries, Fatalities, or Evacuations, 1994-2018



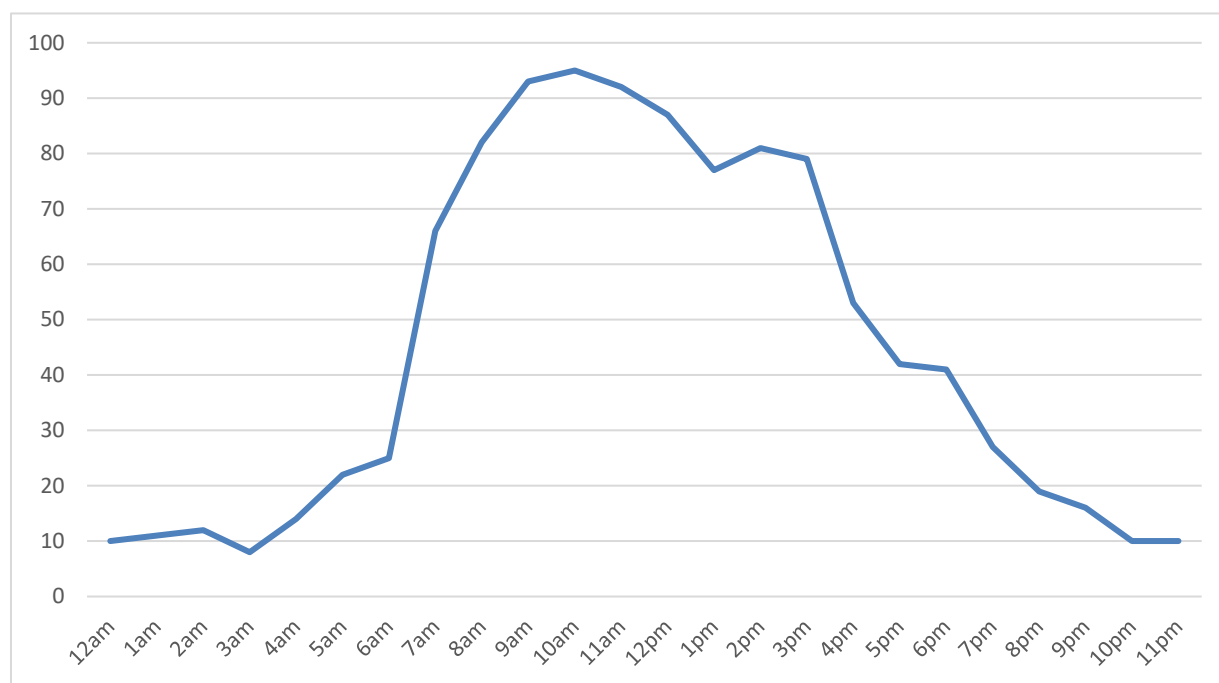
Analysis of the Cal OES data shows a great deal of variation from month-to-month and year-to-year. As shown in Figure 5-88, Hazardous materials incidents are slightly more likely in the winter (6.6 incidents per month on average) and slightly less common in the summer (5.6 incidents per month on average) but occur regularly in all months. Hazardous materials incidents are more common during the daytime hours, as shown in Figure 5-89.

Figure 5-88 Hazardous Materials Incidents by Month



Source: Cal OES Spill Release Reporting (<https://www.caloes.ca.gov/cal-oes-divisions/fire-rescue/hazardous-materials/spill-release-reporting>), analysis by Wood

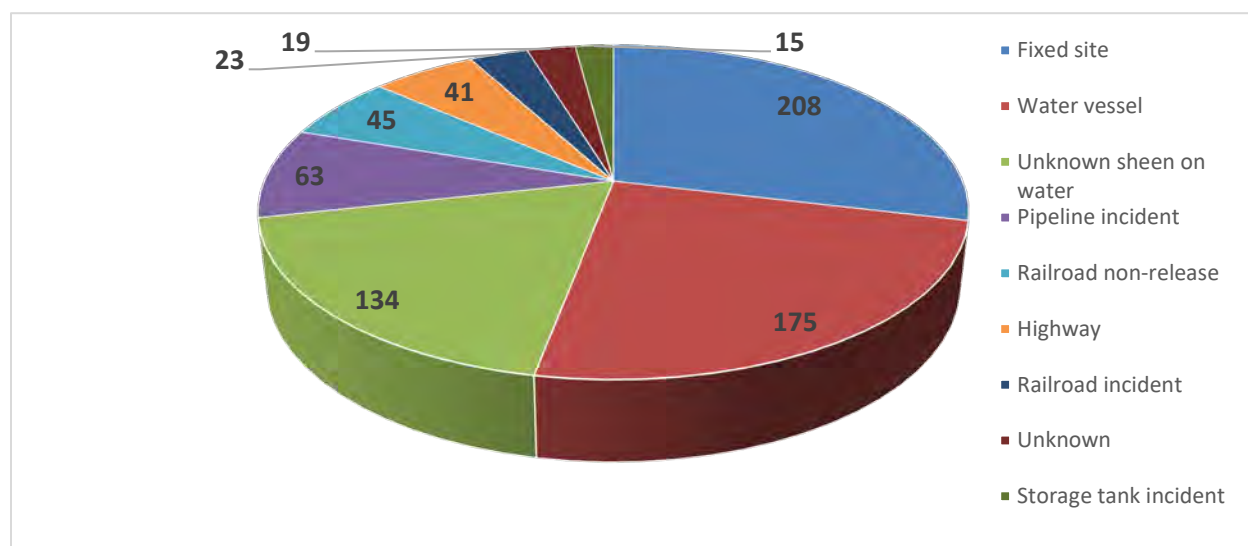
Figure 5-89 Hazardous Materials Incidents by Time of Day



Source: Cal OES Spill Release Reporting (<https://www.caloes.ca.gov/cal-oes-divisions/fire-rescue/hazardous-materials/spill-release-reporting>), analysis by Wood

Figure 5-90 breaks down the incidents reported to RTK NET by type of incident. While fixed site incidents are the largest single category, combining all the transportation-related categories (water vessel, highway, rail, and pipeline) reveals that transportation incidents are far more common than fixed site incidents, at 347 incidents (61%) compared to 223 (39%) for fixed site and storage tank incidents.

Figure 5-90 Hazardous Materials Incidents by Type



Source: U.S. EPA Right-to-Know Network (<http://www.rtk.net>), analysis by Wood

Table 5-122 shows the most common substances involved in releases in San Luis Obispo County. Various oils, gasoline, and diesel fuel together account for two-thirds of spills, followed by unknown substances, sulfur dioxide, anhydrous ammonia, and nitric acid.

Table 5-122 Most Common Hazardous Materials Substances Released in San Luis Obispo County

CHRIS Substances	# of Incidents	CHRIS Substances	# of Incidents
OUN: Unknown oil	151	OTD: Oils, fuel: 2-D	17
ODS: Oils: diesel	85	OMN: Oils, miscellaneous: mineral	16
NCC: Unknown / no CHRIS code	81	AMA: Ammonia, anhydrous	11
OIL: Oils: crude	64	NTX: Nitric oxide	10
SFD: Sulfur dioxide	54	ONG: Natural gas	8
Invalid code: Chris Code Left Blank	38	HDZ: Hydrazine	8
OHY: Hydraulic oil	37	OLB: Oils, miscellaneous: lubricating	7
GAS: Gasoline: automotive (unleaded)	33	OTF: Oils, miscellaneous: transformer	7
OTH: Other oil	33	OOD: Oils, fuel: 1-D	5
UNK: Unknown material	19	BSS: Bilge slops	5
OMT: Oils, miscellaneous: motor	18	PCB: Polychlorinated biphenyl	5

Source: U.S. EPA Right-to-Know Network (<http://www.rtk.net>), analysis by Wood

Probability of Future Occurrences

As discussed above, the county experiences between 80-90 hazardous materials incidents per year, with an average of 1.4 fatalities, 2.4 injuries, and 1.2 incidents requiring evacuations per year. These incidents have been increasing an average of 5% a year, and there is no reason to think they won't continue to increase over the next five years. Thus, there is effectively a 100 percent chance that the county will see a hazardous materials incident in any given year. They can occur at any time and with little predictability given the presence of multiple major transportation routes in the planning area, as well as multiple facilities that store and use hazardous materials.

Climate Change Considerations

There are no known effects of climate change on human-caused hazards such as hazardous material incidents.

Vulnerability

General Property

The impact of a fixed hazardous facility, such as a chemical processing facility is typically localized to the property where the incident occurs. The impact of a small spill (i.e. liquid spill) may also be limited to the extent of the spill and remediated if needed. While cleanup costs from major spills can be significant, they do not typically cause significant long-term impacts to property.

People

Hazardous materials incidents can cause injuries, hospitalizations, and even fatalities to people nearby. People living near hazardous facilities and along transportation routes may be at a higher risk of exposure, particularly those living or working downstream and downwind from such facilities. For

example, a toxic spill or a release of an airborne chemical near a populated area can lead to significant evacuations and have a high potential for loss of life.

In addition to the immediate health impacts of releases, a handful of studies have found long term health impacts such as increased incidence of certain cancers and birth defects among people living near certain chemical facilities. However there has not been sufficient research done on the subject to allow detailed analysis.

Social Vulnerability

While hazardous material incidents could take place anywhere across the county and may be unpredictable, those living near HazMat facilities or along transportation routes that additionally happen to be socially vulnerable would be of highest concern. Based on a combination of the SoVI data presented and discussed in subsection 4.4.1 and the presence of major transportation routes and EPA or CalARP regulated facilities the most vulnerable populations include Paso Robles, Atascadero, San Luis Obispo, Arroyo Grande, Grover Beach, Oceano and Nipomo. In addition, agricultural workers are most vulnerable to pesticide exposure.

Critical Facilities and Infrastructure

Impacts of hazardous material incidents on critical facilities are most often limited to the area or facility where they occurred, such as at a transit station, airport, fire station, hospital, or railroad. However, they can cause long-term traffic delays and road closures resulting in major delays in the movement of goods and services. These impacts can spread beyond the planning area to affect neighboring counties, or vice-versa. While cleanup costs from major spills can be significant, they do not typically cause significant long-term impacts to critical facilities.

Economy

The primary economic impact of hazardous material incidents results from lost business, delayed deliveries, property damage, and potential contamination. Large and publicized hazardous material-related events can deter tourists and recreationists and could potentially discourage residents and businesses. Economic effects from major transportation corridor closures can be significant.

Historic, Cultural, and Natural Resources

Hazardous material incidents may affect a small area at a regulated facility or cover a large area outside such a facility. Widespread effects occur when hazards contaminate the groundwater and eventually the municipal water supply, or they migrate to a major waterway or aquifer. Impacts on wildlife and natural resources can also be significant.

Future Development

The amount of hazardous materials that are stored, used, and transported across the county are inferred to continue to increase over the next five years based on regional growth trends. As discussed previously, the number of hazardous materials incidents in San Luis Obispo County has been increasing roughly 5% a year for the last twenty years and is likely to continue to increase. Future development is also expected to increase the number of people potentially exposed to the impacts of hazardous materials incident. 5,003 building permits were issued in San Luis Obispo County between 2014 and 2019; 61% of those were

within 0.5 mile of a CalARP or RMP hazardous materials facility or transportation route. The following table provides additional details.

Table 5-123 Building Permits Issued Near Hazardous Materials Facilities and Transportation Routes, 2014-2019

Building Permits Issued 2014-2019	Number	Percentage
Total	5,003	100%
Within ½ mile of RMP or CalARP Facility	203	4%
Within ½ mile of highway hazardous materials route (US 1; State 46, 101, 106)	1,749	35%
Within ½ mile of railroad line	862	17%
Within ½ mile of airport	238	5%

Source: San Luis Obispo County, analysis by Wood

Risk Summary

The overall significance of hazardous materials incidents in San Luis Obispo County is Medium. These incidents occur frequently with little-to-no warning, both at fixed sites and along transportation routes throughout the county. The possibility of a major spill impacting a major populated area exists, historically the impacts of these incidents on the county as a whole have been fairly limited.

- The county experiences between 80-90 hazardous materials incidents per year, with an average of 1.4 fatalities, 2.4 injuries, and 1.2 incidents requiring evacuations per year. These incidents have been increasing an average of 5% a year.
- 61% of releases are transportation related, compared to 39% at fixed facilities.
- Hazardous materials releases can complicate response to and recovery from natural disasters such as floods and earthquakes.
- *Effects on people:* Hazardous Materials incidents can cause injuries and fatalities, as well as long term health problems like increased cancer risks.
- *Effects on property:* Impacted properties can require cleanup, but the effects are usually localized to the site of the release.
- *Effects on economy:* Extended road closures can result in economic losses and impact tourism.
- *Effects on critical facilities and infrastructure:* Impacted facilities and infrastructure can require cleanup, but the effects are usually localized to the site of the release.
- *Related Hazards:* Earthquake, Flood, Tsunami.

Table 5-124 Hazardous Materials Risk Summary

Jurisdiction	Geographic Extent	Probability of Future Occurrence	Magnitude/Severity	Overall Significance
San Luis Obispo County	Limited	Highly Likely	Negligible	Medium
City of Arroyo Grande	Significant	Highly Likely	Negligible	Medium
City of Atascadero	Significant	Highly Likely	Negligible	Medium
City of Grover Beach	Limited	Occasional	Negligible	Low
City of Morro Bay	Limited	Occasional	Negligible	Medium
City of Paso Robles	Extensive	Highly Likely	Negligible	Low

Jurisdiction	Geographic Extent	Probability of Future Occurrence	Magnitude/Severity	Overall Significance
City of Pismo Beach	Limited	Likely	Limited	Medium
City of San Luis Obispo	Significant	Highly Likely	Negligible	Medium
Avila Beach CSD	Significant	Highly Likely	Negligible	Medium
Ground Squirrel Hollow CSD	Limited	Occasional	Negligible	Low
Heritage Ranch CSD	Limited	Occasional	Negligible	Low
Los Osos CSD	Limited	Occasional	Negligible	Low
Nipomo CSD	Significant	Highly Likely	Negligible	Medium
San Miguel CSD	Significant	Likely	Negligible	Medium
San Simeon CSD	Limited	Highly Likely	Negligible	Medium
Templeton CSD	Significant	Likely	Limited	Low
Cayucos Sanitary District	Limited	Unlikely	Negligible	Low
Port San Luis Harbor District	Extensive	Unlikely	Catastrophic	High
San Luis Obispo FCWCD	Significant	Highly Likely	Negligible	Medium
South San Luis Obispo Sanitary District	Limited	Unlikely	Negligible	Low



SECTION 6 CAPABILITY ASSESSMENT

Thus far, the planning process has identified the hazards posing a threat to San Luis Obispo County and described, in general, the vulnerability of the County to these risks. The next step is to assess what loss prevention mechanisms are already in place. This part of the planning process is the mitigation capability assessment. Combining the risk assessment with the mitigation capability assessment results in the County's "net vulnerability" to disasters and more accurately focuses the goals, objectives, and proposed actions of this plan.

As such, this section presents San Luis Obispo County's mitigation capabilities: programs and policies currently in use to reduce hazard impacts or that could be used to implement hazard mitigation activities. It also identifies select state and federal departments/agencies that can supplement the County's mitigation capabilities. This assessment is divided into four sections: regulatory mitigation capabilities, administrative and technical mitigation capabilities, fiscal mitigation capabilities and hazard specific capabilities. Information about capabilities specific to the other participating jurisdictions can be found in the jurisdictional annexes.

The HMPC used a two-step approach to originally conduct this assessment for the County. First, an inventory of common mitigation activities was made through the use of a matrix. The purpose of this effort was to identify policies and programs that were either in place, needed improvement, or could be undertaken, if deemed appropriate. Second, the HMPC reviewed existing policies, regulations, plans, and programs to determine if they contributed to reducing hazard-related losses or if they inadvertently contributed to increasing such losses. During the 2019 update, this section was reviewed by County staff and the Wood consultant team to update information where applicable.

This update process afforded the County and its participating jurisdictions the opportunity to review their previous capabilities and note the ways in which these capabilities have improved or expanded since the adoption of the previous plan. Additionally, in summarizing their current capabilities and identifying gaps, plan participants also considered their ability to expand or improve upon existing policies and programs as potential new mitigation strategies. Section 7 Mitigation Strategy includes mitigation actions aimed at improving community capability to reduce hazard risk and vulnerability.

6.1 San Luis Obispo County's Regulatory Mitigation Capabilities

Table 6-1 lists regulatory mitigation capabilities, including planning and land management tools, typically used by local jurisdictions to implement hazard mitigation activities and indicates those that are in place in San Luis Obispo County. Excerpts from applicable policies, regulations, and plans and program descriptions follow to provide more detail on existing mitigation capabilities. For each of the profiled hazards, several ordinances, regulations, plans and programs were identified in various communities within County. These are listed here to serve as a reference for related planning efforts.



Table 6-1 San Luis Obispo's Regulatory Mitigation Capabilities

Regulatory Tool (ordinances, codes, plans)	Yes/No	Comments
General Plan	Y	Agricultural Element, Conservation and Open Space Element, Economic Element, Housing Element, Noise Element, Offshore Energy Element, Parks and Recreation Element, Safety Element; Land Use Element: Framework for Planning – Coastal Zone, and Framework for Planning - Inland
Zoning ordinance	Y	Inland Land Use Ordinance and Coastal Zone Land Use Ordinance (Titles 22 and 23)
Subdivision ordinance	Y	Title 21 Real Property Division Ordinance
Growth management ordinance	Y	Title 26
Floodplain ordinance	Y	County Land Use Ordinance Section 22.14.060; One foot above base flood elevation freeboard requirement for all structures.
Other special purpose ordinance (stormwater, steep slope, wildfire)	Y	Stormwater Management Chapter 22.10.155; California Fire Code 16.10; Post-Disaster Regulations 19.85; Combining Designation Standards Chapter 23.07; Geologic Study Area (GSA) 23.07.080; Title 22 Grading Ordinance
Building code	Y	Title 19, Chapter 19.03 of County Code. Adopted 2016 California Building Codes: CA Residential Code (2016); CA Plumbing Code (2015 UPC); CA Mechanical Code (2015 UMC); CA Electrical Code (2014 NEC); CA Energy Code (2016); CA Green Building Code (2016); CA Fire Code (2015 IFC); CA Reference Standards Code (2016)
Fire department ISO rating	Y	6
Erosion or sediment control program	Y	Erosion and Sedimentation Control Plan Required 22.52.120; 23.05.036
Stormwater management program	Y	22.10.155; Post-Construction and During Construction Stormwater Management requirements
Site plan review requirements	Y	Title 22 Article 3
Capital improvements plan	Y	FY 2019-20 through FY 2023-24
Economic development plan	Y	Economic Element (2012) of General Plan
Local emergency operations plan	Y	County EOP (2016)
Other special plans	Y	CWPP (2019) Dam and Levee Failure Plan (2016); Tsunami Emergency Response Plan (2016); Earthquake Emergency Response Plan (2015); Hazardous Materials Emergency Response Plan (2013); Disaster Recovery Plan (2018); Diablo Canyon emergency response and evacuation plans; Tsunami evacuation plans; Wildland Fire Pre-attack Plans; Wildland Fire evacuation plans for West Atascadero, Parkhill, Avila, Cambria, Upper Los Berros, Suey Creek.
Flood insurance study or other engineering study for streams	Y	2012
Elevation certificates (for floodplain development)	Y	Required by 22.14.060(D)(4). On file with the Public Works Department.



Regulatory Tool (ordinances, codes, plans)	Yes/No	Comments
Other	Y	Water Efficient Landscaping 19.90; Transfer of Development Credit Program; Fire Safety Plans 22.50; CUPA Program (Hazardous Materials and Waste) Unreinforced Masonry Building Removal program; Community Health Improvement Plan (2018-2023)

As indicated in the table above, San Luis Obispo County has several plans and programs that guide the County's development in hazard-prone areas. Starting with the San Luis Obispo County General Plan, which is the most comprehensive of the County's plans when it comes to mitigation, some of these are described in more detail below.

6.1.1 San Luis Obispo County General Plan

The San Luis Obispo County General Plan consists of multiple element documents (12), as well as two Frameworks for Planning (Inland and Coastal) and four Area Plans. This discussion is derived primarily from four Element documents of the San Luis Obispo County General Plan, from which the text that follows is largely extracted.

The County's General Plan is a comprehensive, long-term framework for the protection of the county's agricultural, natural, and cultural resources and to direct future development in the county. Designed to meet state general plan requirements, it outlines policies, standards, and programs and sets out plan proposals to guide day-to-day decisions concerning San Luis Obispo County's future. It is a legal document that serves as the County's "blue print" or "constitution" for land use and development.

The General Plan Policy Document is organized into twelve elements, which generally correspond with the content requirements specified in State Planning Law. The following four elements have goals, policies and implementation measures related to hazards and hazard mitigation and are detailed further below:

- Safety Element
- Agricultural Element
- Conservation and Open Space Element
- Land Use Element

Each of these elements include goal statements relating to different aspects of the issues addressed in the element. Under each goal statement, the plan sets out policies that amplify the goal statement, policies, and implementation strategies. Implementation strategies are listed and described briefly with the action proposed by the program, the County agencies or departments with primary responsibility for carrying out the program, the time frame for accomplishing the program and potential funding sources.

The following is an element-by-element summary of the General Plan goals and policies that are most relevant to the Hazard Mitigation Plan Update. The summary tracks the organization of each element, with topically-focused goals followed by related policies.

Safety Element

The County concurrently updated the Safety Element of the General Plan during the 2019 update of the HMP, with finalization of the Safety Element anticipated by mid-2020. The information from the Hazard Identification and Risk Assessment of the HMP was used to inform the Safety Element, and the goals and

policies in both documents were aligned to be coordinated and mutually reinforcing. The document was updated previously in 1999.

Planning for growth and development requires the consideration of a wide range of public safety issues. Many of the safety risks associated with development, including risks to buildings and infrastructure, can be avoided through siting decisions made at the planning stages of development, while others may be lessened through the use of mitigation measures in the planning and land use review process. This element outlines San Luis Obispo County's strategy for ensuring the maintenance of a safe physical environment. Applicable goals and policies from the draft update of the Safety Element (as of November 2019) are presented below. As the HMP was finalized prior to the Safety Element update, the following are subject to change when the Safety Element is finalized in 2020.

Emergency Preparedness

This section of the Safety Element is specific to preparing for emergencies as well as recovery needs post-disaster. The section also recognizes, "an important part of preparedness is the careful assessment of risks before an emergency occurs (San Luis Obispo County, 1999). The following policies are set forth in the section to help the County achieve its goal of emergency preparedness and are applicable to hazard mitigation.

Table 6-2 Emergency Preparedness Goal and Policies

Goal 1:	Support programs that provide emergency and other services to the public when a disaster occurs. The focus of response activities is saving lives and preventing injury and reducing immediate property damage.
Policy 1.1:	Coordination. Improve coordination among City, County and State programs, and among others working to reduce the risks of disasters. This should also include improved coordination with the news media. This will result in more effective preparedness, response and recovery from disasters.
Policy 1.2:	Information Systems and Research. Expand and keep current the database of safety related information. Knowledge about disasters and the area we live in is growing. New information must be made available to the public and decision makers. Regularly update the GIS data as new information becomes available.
Policy 1.3:	Risk Assessment. Continue investigations that reduce or eliminate long term risks. Risk assessment activities, effectively carried out, can improve the efficiency and reduce the cost of response and recovery from disasters.

Geologic and Seismic Hazards



This section is specific to the various types of geologic and seismic hazards in San Luis Obispo County. Geologic hazards include, slope instability and landslides. Seismic hazards profiled include, fault rupture, ground shaking, and liquefaction and seismic settlement hazards. This section also covers coastal bluff erosion hazards. The purpose of this section is to help in assessing the vulnerability of development to these types of geologic hazards. The following policies set forth in the section are applicable to hazard mitigation and help the County achieve its goal of minimizing the potential for loss of life and property as a result of geologic and seismic hazards.

Table 6-3 Geologic and Seismic Hazard Goal and Policies

Goal 4:	Minimize the level of injury, loss of life and damage to existing and future critical facilities, property and infrastructure due to geologic and seismic hazards.
Policy 4-1:	Resilient Design. Develop a comprehensive approach to reducing the level of damage and losses due to hazards through utilizing resilient community and critical infrastructure design, management, code enforcement, GIS mapping, improved policies, procedures, training evacuation planning, and planning processes.
Policy 4-2:	Fault Information. Information on faults and geologic hazards in the County should continue to be updated. The County will enforce the General Plan and applicable building codes that require developments, structures, and public facilities to address geologic and seismic hazards through the preparation and approval of geotechnical and geologic reports. Appointment of a County Geologist will improve implementation of the goals, policies, programs and standards of this Element by assuring more objective review and consistent enforcement of hazard mitigation measures county-wide than is possible under the present system of project review.
Policy 4-3:	Fault Rupture Hazards. Locate new development away from active and potentially active faults to reduce damage from fault rupture. Fault studies may need to include mapping and exploration beyond project limits to provide a relatively accurate assessment of a fault's activity. The County will enforce applicable regulations of the Alquist-Priolo Earthquake Fault Zoning Act pertaining to fault zones to avoid development on active faults.
Policy 4-4:	Reduce Seismic Hazards. The County will enforce applicable building codes relating to the seismic design of structures to reduce the potential for loss of life and reduce the amount of property damage.
Policy 4-5:	Liquefaction and Seismic Settlement. The County will require design professionals to evaluate the potential for liquefaction or seismic settlement to impact structures in accordance with the currently adopted Uniform Building Code.



Policy 4-6:	Slope Instability. The County acknowledges that areas of known landslide activity are generally not suitable for residential development. The County will avoid development in areas of known slope instability or high landslide risk when possible and continue to encourage that developments on sloping ground use design and construction techniques appropriate for those areas.
Policy 4-7:	Readiness and Response. Fire and law enforcement agencies will maintain and improve their ability to respond to seismic emergencies throughout the County.
Policy 4-8:	Coastal Bluff. Development shall not be permitted near the top of eroding coastal bluffs.
Policy 4-9:	Unreinforced Masonry Buildings. Reduce the danger to people and property from unreinforced masonry buildings.

Fire Safety

This chapter of the Safety Element is specific to fire hazards, including urban fires and wildfire hazards. The Fire Safety chapter acknowledges that fire plays a significant role in the County's ecosystem and that development patterns can influence a fire agency's response and ability to defend "values at risk". The following policies set forth in the chapter are applicable to hazard mitigation and help the County achieve its goal of reducing the threat of fire hazards.

Table 6-4 Fire Safety Goals and Policies

Goal 5:	Mitigate Wildfire hazard impacts to existing and future development.
Policy 5-1:	Pre-Fire Management. New development should be carefully located, with special attention given to fuel management in higher fire risk areas. Large, undeveloped areas should be preserved so they can be fuel-managed. New development in fire hazard areas should be configured to minimize the potential for added danger.
Policy 5-2:	Loss Prevention. Improve structures and other values at risk to reduce the impact of fire. Regulations should be developed to improve the defensible area surrounding habitation.
Policy 5-3	Limit Development. Limit new development in areas identified as State Responsibility Areas (SRAs) or Very High Fire Hazard Severity Zones in Local Responsibility Areas or other areas determined to have a high wildfire risk.
Policy 5-4	Streamline Reviews.

	Expedite reviews for reconstruction of fire-damaged structures, while adopting current codes and standards in State Responsibility Areas (SRAs) or Very High Fire Hazard Severity Zones.
Policy 5-5	Wildfire Protection Planning. Encourage the development of community wildfire protection plans to supplement existing codes and regulations.
Policy 5-6	Expert Review. Include professional fire planning experts and Fire Department in the planning review process for projects located in High and Very High Fire Hazard Areas to consistently evaluate fire safe design, potential impacts related to fire safety, and to identify effective measures to minimize potential impacts related to wildland fire.
Policy 5-7	Post-Fire Streamlining. Encourage rapid post-fire assessment and rehabilitation of burned lands to limit soil erosion, protect water quality, minimize flooding, restore damaged landscapes and assist landowners in re-establishing fire-safe homesites.
Policy 5-8	Landowner Education. Facilitate education of landowners about the risks of living in the wildland urban interface including regulations, prevention measures and pre-application activities.

Water Hazards

This chapter of the Safety Element is specific to flood, dam failure, tsunami, and coastal erosion hazards. The following policies and implementation measures set forth in the chapter are applicable to hazard mitigation and help the County achieve its goal of reducing damage caused by water related hazards.

Table 6-5 Water Hazards Goal and Policies

Goal 7	Mitigate flood hazard impacts to existing and future development.
Policy 7.1	Resilient Development and Design. New development or redevelopment shall be sited and designed to avoid or minimize coastal flooding; and shall take into account significant storm events, tidal inundation, and predicted sea level rise over the anticipated life of the development.
Policy 7.2	Flood Hazards. Strictly enforce flood hazard regulations both current and revised. FEMA regulations and other requirements for the placement of structures in flood plains shall be followed. Maintain standards for development in flood-prone and poorly drained areas.
Policy 7.3:	Reduce Flood Damage. Reduce flood damage in areas known to be prone to flooding, such as Los Osos, Avila Valley, Santa Margarita, Cambria, Oceano and others.

Policy 7.4:	Floodplain Management. Promote and implement sound floodplain management through continued compliance with the National Flood Insurance Program and consistent implementation of the County Land Use Ordinance Section 22.14.060.
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Other Safety Issues

This chapter speaks to aircraft hazards, radiation hazards, hazardous materials, electromagnetic fields, radon and hazardous trees. The following policies captured are applicable to hazard mitigation and are related to manmade hazards that are profiled in this plan as well as hazardous trees.

Table 6-6 Human Caused Hazards Goal and Policies

Goal 10:	Reduce the potential for harm to individuals and damage to the environment from radiation hazards, hazardous materials, and hazardous trees.
Policy 10.1:	Radiation Hazards. Maintain a high level of emergency preparedness and information to the public.
Policy 10.2:	Hazardous Materials. Reduce the potential for exposure to humans and the environment by hazardous substances.
Policy 10.3:	Hazardous Trees. Reduce the danger to people and property from trees that are weakened and susceptible to falling or limb loss during storms.

Agricultural Element

This element focuses on the agricultural economy and resources of San Luis Obispo County, “while recognizing that other valuable open space resources such as wetlands, riparian vegetation or scenic resources can exist on those agricultural lands” (San Luis Obispo County, 2010). The policies within the Agricultural Element apply primarily to land designated Agriculture on the County’s land use designation maps. The applicable policy measures from the Agricultural Element are presented below.

Table 6-7 Agricultural Element Policies

Policies and Implementation Measures Regarding the Use of Agricultural Land	
Policy AGP9:	Soil Conservation. <ol style="list-style-type: none"> Encourage landowners to participate in programs that reduce soil erosion and increase soil productivity. Promote coordination between the Natural Resources Conservation Service, Resource Conservation Districts, Consolidated Farm Services Agency, Morro Bay State and National Estuary, and other agencies and organizations. Emphasize the long-range benefits of proper drainage control and tillage, cropping, soil amendment, and grazing techniques to minimize soil erosion.

	<p>c. Assure that roads and drainage systems on county-controlled properties and facilities do not negatively impact agricultural lands and that the roads and systems are properly maintained.</p> <p>Loss of topsoil is a threat to the continued productivity of agricultural lands. The purpose of this policy is to minimize the loss of topsoil by encouraging broad-based cooperation between property owners, ag operators, agencies and organizations that will lead to effective soil conservation practices on farmlands and on county-controlled properties.</p>
Policy AGP10:	<p>Water Conservation.</p> <p>a. Encourage water conservation through feasible and appropriate “best management practices.” Emphasize efficient water application techniques; the use of properly designed irrigation systems; and the control of runoff from croplands, rangelands, and agricultural roads.</p> <p>b. Encourage the U.C. Cooperative Extension to continue its public information and research program describing water conservation techniques that may be appropriate for agricultural practices in this county. Encourage landowners to participate in programs that conserve water.</p> <p>Land area, the water falling on it, and groundwater stored beneath its surface are inseparable in determining agricultural values and productivity in the County. Other than the land itself, water is the most precious resource for agriculture. Conserving water can benefit agriculture by reducing groundwater pumping. Uncontrolled runoff can contribute to soil loss, reduced water quality in streams, increased impact on riparian habitat, decreased opportunity for groundwater recharge and degradation of the general productivity of the watershed.</p>
Policy AGP11:	<p>Agricultural Water Supplies.</p> <p>a. Maintain water resources for production agriculture, both in quality and quantity, so as to prevent the loss of agriculture due to competition for water with urban and suburban development.</p> <p>b. Do not approve proposed general plan amendments or rezonings that result in increased residential density or urban expansion if the subsequent development would adversely affect: (1) water supplies and quality, or (2) groundwater recharge capability needed for agricultural use.</p> <p>c. Do not approve facilities to move groundwater from areas of overdraft to any other area, as determined by the Resource Management System in the Land Use Element.</p>
Policy AGP12:	<p>Pest, Vertebrate, and Weed Management.</p> <p>a. Assure that pests such as squirrels and noxious weeds are managed on county owned properties so as to avoid impacts on agriculture.</p> <p>b. Encourage the use of integrated pest management techniques to manage pests, vertebrates, and weeds on both public and private lands.</p>



	d. Support and promote programs that help landowners learn pest control methods, utilizing the expertise of the U.C. Cooperative Extension and the County Agriculture Department.
Policies Regarding the Protection of Agricultural Lands	
Policy AGP15:	Transfer of Development Credits (TDC) <ul style="list-style-type: none"> a. Continue to utilize a voluntary TDC program to help protect agricultural resources by guiding development to more suitable areas.
Policy AGP26:	Streams and Riparian Corridors. <ul style="list-style-type: none"> a. Encourage private landowners to protect and preserve stream corridors in their natural state and to restore stream corridors that have been degraded. Provide information and incentives to eliminate overgrazing in stream corridors. Encourage off-stream livestock watering sources. b. For new development requiring a discretionary permit and for land divisions, protect streams and riparian habitat affected by the proposal through the following measures: <ol style="list-style-type: none"> 1. Consistent with the requirements of the Regional Water Quality Control Board's Basin Plan, establish a grading and building setback of 30 feet from the top of the stream bank. Locate buildings and structures outside the setback. Do not remove riparian vegetation within 30 feet of the top of the stream bank. Provide for adjustments when the applicant demonstrates that such setbacks would have a significant negative impact on the agricultural viability of the site, or where alternatives are infeasible or more environmentally damaging, and the adjustments are acceptable to the Regional Board. 2. Require appropriate erosion control measures during and following construction. 3. Consistent with state and federal requirements, allow stream alterations for water supply and flood control projects, road maintenance, maintenance of existing channels, or improvement of fish and wildlife habitat if there are no practical alternatives. 4. Consistent with state and federal requirements, assure that stream diversion structures protect habitats. 5. When significant impacts to stream or riparian resources are identified, the landowner shall implement county-approved mitigation measures consistent with the existing requirements of CEQA.

Conservation and Open Space Element

Applicable goals and policies from the Conservation and Open Space Element are presented below. Implementation measures related to each policy can be found in the General Plan.

Air Quality

This chapter focuses on local and regional air quality and sets forth goals and policies for the County to reduce its contribution to global climate change.

Table 6-8 Air Quality and Climate Change Adaption Goal and Policies

Goal AQ 5:	The County will adapt to adverse climate change.
Policy AQ 5.1:	Adapt to Climate Change. Identify needs and strategies to monitor, prepare for, and adapt to a changing climate.
Policy AQ 5.2:	Public Awareness. Increase public awareness about climate change and lifestyle changes that will reduce greenhouse gas emissions.

Biological Resources

This chapter identifies biological resources of importance for the County and puts forth a framework to achieve a “future that is healthy and vibrant ecologically, socially and economically.

Table 6-9 Biological Resources Goals and Policies

Goal BR 2:	Threatened, rare, endangered, and sensitive species will be protected
Policy BR 2.7:	Fire Suppression and Sensitive Plants. Balance the need for fire suppression and/or vegetation (fuel) management with the need to protect sensitive biological resources. Where possible, design land divisions and development so that fuel-breaks, vegetation, or fuel modification areas that are needed to reduce fire hazards do not disrupt special-status plant communities or critical habitat for special status animal species. Fuel-breaks and vegetation or fuel modification areas shall be located on the development side of required setbacks from sensitive features and shall be in addition to the required setbacks.
Policy BR 2.11:	Control Spread of Non-native Invasive Animal Species. The County will work with landowners, the California Department of Fish and Game, the U.S. Fish and Wildlife Service, the National Marine Fisheries Service, the National Invasive Species Council, and other agencies and organizations to control and prevent the spread of non-native, invasive animal species.
Goal BR 3:	Maintain the acreage of native woodlands, forests and trees as 2008 levels.
Policy BR 3.1:	Native Tree Protection. Protect native and biologically valuable trees, oak woodlands, trees with historical significance, and forest habitats to the maximum extent feasible.
Policy BR 3.2:	Protection of Native Trees in New Development. Require proposed discretionary development and land divisions to avoid damage to native trees (e.g., Monterey Pines, oaks) through setbacks, clustering, or other appropriate measures. When avoidance is not feasible, require mitigation measures.
Policy BR 3.4:	Vegetation and Wildlife Disease Management Programs.



	Continue to support agency programs to limit the impacts of Sudden Oak Death syndrome and any other potential or existing diseases harmful to native vegetation and wildlife in the county, while addressing any potential adverse effects on sensitive resources.
Goal BR 4:	The natural structure and function of streams and riparian habitats will be protected and restored
Policy BR 4.2	Minimize Impacts from Development. Minimize impacts of public and private development on streams and associated riparian vegetation due to construction, grading, resource extraction, and development near streams/
Policy BR 4.3	Alluvial Well Extractions. Require discretionary projects that depend on alluvial well extractions and stream diversion to monitor the long-term effects on surface streamflow and riparian vegetation. Identify and implement contingencies for maintaining streamflow (e.g., minimum bypass flows, alternate water sources, decreased pumping rates, groundwater discharge).
Policy BR 4.5	Encourage Stream Preservation on Private Lands. Encourage private landowners to protect and preserve stream corridors in their natural state and to restore stream corridors that have been degraded.
Policy BR 4.6	Encourage Stream Preservation on Public Lands. Protect stream and riparian corridors in their natural state on public lands.
Policy BR 4.10	Vector Control. Control vectors to prevent disease problems in keeping with good conservation principles. Vector control practices should minimize disturbance of the environment.
Goal BR 7:	Significant Marine Resources will be protected.
Policy BR 7.1:	Coastal Protection. The County should continue to advocate sound energy and coastal protection policies and oppose proposals along the San Luis Obispo County coastline that are inconsistent with the County's Local Coastal Program and other County plans and policies.
Policy BR 7.3:	Best Management Practices. Support landowners that participate in education and assistance programs and other voluntary and cooperatives programs, such as conservation programs offered by the Natural Resources.
Policy BR 7.7:	Watershed Protection. As a complement to regulatory and enforcement programs, promote a voluntary, cooperative, educational, and incentive-based approach to protect Morro Bay and its watershed. Where appropriate, continue to obtain open space easements for sensitive wetlands and bayfront areas, and encourage other agencies and conservation organizations to obtain open space and conservation easements and fee title to these areas

Energy

This chapter set goals, policies and implementation measures related to the energy sector in the County and ensure future energy development is done responsibly and sustainably. The following goals and policies are applicable to hazard mitigation.

Table 6-10 Energy Goals and Policies

Goal E 4:	Green building practices will be integrated into all development.
Policy E 4.4:	Solar Exposure. Orient new buildings to maximize solar resources, shading, ventilation, and lighting.
Goal E 7:	Design, Siting, and Operation of non-renewable energy facilities will be environmentally appropriate.
Policy E 7.1:	Non-Renewable Energy Facility Siting. Energy, fossil fuel and related facilities will be sited, constructed and operated in a manner to protect the public from potential hazards and significant environmental impacts.
Policy E 7.3:	Safety Coordination. The County will coordinate with state and federal agencies to promote an information exchange about safety standards and regulations with regard to electricity and fossil fuel facilities.
Policy E 7.4:	National Repository for Nuclear Waste. Carefully monitor the federal government's progress in establishing a national repository for high-level nuclear waste and the state's efforts for low-level nuclear waste disposal. The County should advocate the safest methods of transportation and storage.

Open Space Resources

This chapter set goals, policies and implementation measures to ensure the protection, restoration, and preservation of significant open features throughout San Luis Obispo County.

Table 6-11 Open Space Resources Goal and Policy

Goal OS 1:	Important open space areas will be identified, protected, sustained and where necessary, restored and reclaimed.
Policy OS 1.1:	Future Open Space Protection. Continue to identify and protection open space resources with the following characteristics: <ul style="list-style-type: none"> • Recreation areas, • Ecosystems and environmentally sensitive resources such as natural area preserves, streams, and riparian vegetation, unique, sensitive habitat, natural communities' significant marine resources, • Archaeological, cultural, and historical resources, • Scenic areas, • Hazard areas, • Rural character

Soil Resources

This chapter set goals, policies and implementation measures to ensure the protection, restoration, and preservation of significant open features throughout San Luis Obispo County.

Table 6-12 Soil Resources Goals and Policies

Goal SL 1:	Soils will be protected from wind and water erosion, particularly that caused by poor soil management practices.
Policy SL 1.2:	Promote Soil Conservation Practices in All Land Uses. Require erosion and sediment control practices during development or other soil-disturbing activities on steep slopes and ridgelines. These practices should disperse stormwater so that it infiltrates the soil rather than running off and protect downslope areas from erosion.
Policy SL 1.3:	Minimize Erosion Associated with New Development. Avoid development, including roads and driveways, on the steeper portions of a site except when necessary to avoid flood hazards, protect prime soils, and protect sensitive biological and other resources. Avoid grading and site disturbance activities on slopes over 30%. Minimize site disturbance and protect existing vegetation as much as possible.
Goal SL 2:	Watershed and ecological function will be maintained through soil conservation.
Policy SL 2.1:	Protect Watersheds and Aquifer Recharge Areas. Give high priority to protecting watersheds, aquifer-recharge areas, and natural drainage systems when reviewing applications for discretionary development.

Water Resources

This chapter set goals, policies and implementation measures that connect water supply and land use planning in the County that will ensure a sustainable water supply.

Table 6-13 Water Resources Goals and Policies

Goal WR 1:	The County will have a reliable and secure regional water supply (IRWM).
Policy WR 1.1:	Protect water supplies. Continue to coordinate with water suppliers and managers to identify water management strategies to protect existing and secure new water supplies.
Policy WR 1.2:	Conserve Water Resources Water conservation is acknowledged to be the primary method to serve the county's increasing population. Water conservation programs should be implemented countywide before more expensive and environmentally costly forms of new water are secured.
Policy WR 1.3:	New Water Supply. Development of new water supplies should focus on efficient use of our existing resources. Use of reclaimed water, interagency cooperative projects, desalination of contaminated groundwater supplies, and groundwater recharge projects should be considered prior to using imported sources of water or seawater desalination, or dams and on-stream reservoirs.

Policy WR 1.4:	Use Reclaimed Water. The County will be a leader in the use of reclaimed water. Support expanding the use of reclaimed water to make up at least 5% of total water use by 2015 and 10% of total water use by 2020.
Policy WR 1.5:	Interagency Projects. Help implement interagency projects, including emergency interties between systems, jointly developed facilities, water exchanges, and other methods of enhancing reliability through cooperative efforts.
Policy WR 1.7:	Agricultural Operations. Groundwater management strategies will give priority to agricultural operations. Protect agricultural water supplies from competition by incompatible development through land use controls.
Policy WR 1.11:	Reduce RMS alert levels. The County will work with local agencies to reduce Resource Management System alert levels for water supply and water systems from recommended or certified Levels of Severity II or III to Level of Severity I or better by 2020.
Policy WR 1.12:	Impacts of new development. Accurately assess and mitigate the impacts of new development on water supply. At a minimum, comply with the provisions of Senate Bills 610 and 221.
Goal WR 2:	The County will collaboratively manage groundwater resources to ensure sustainable supplies for all beneficial uses.
Policy WR 2.1:	Groundwater quality assessments. Prepare groundwater quality assessments, including recommended monitoring, and management measures.
Policy WR 2.2:	Groundwater basin reporting programs. Support monitoring and reporting programs for groundwater basins in the region.
Policy WR 2.3:	Well permits. Require all well permits to be consistent with the adopted groundwater management plans.
Policy WR 2.4:	Groundwater recharge. Where conditions are appropriate, promote groundwater recharge with high-quality water.
Policy WR 2.5:	Groundwater banking programs. Encourage groundwater-banking programs.
Goals WR 3:	Excellent water quality will be maintained for the health of people and natural communities.
Policy WR 3.6:	Prevent pollution of water sources. The County will collaborate with private and nonprofit land managers, Resource Conservation Districts, recreation providers, Community Services Districts, and other stakeholders to prevent pollution or contamination of potable water sources, such as Lake Nacimiento and Lopez Lake. The County will also coordinate with the Nacitone Watershed Plan.
Goal WR 4:	Per capita potable water use in the county will decline by 20 percent by 2020.
Policy WR 4.8:	Efficient irrigation.



	Support efforts of the resource conservation districts, California Polytechnic State University (CalPoly), the University of California Cooperative Extension, and others to research, develop, and implement more efficient irrigation techniques.
Goal WR 5:	The best possible tools and methods available will be used to manage water resources.
Policy WR 5.1:	Watershed approach. The County will consider watersheds and groundwater basins in its approach to managing water resources in order to include ecological values and economic factors in water resources development.
Policy WR 5.2:	Climate Change. The County will consider ongoing research on long-term changes in climate and precipitation patterns in the county and region and incorporate relevant data in its approach to managing water resources.
Goal WR 6:	Damage to life, structures, and natural resources from floods will be avoided.
Policy WR 6.1:	Integrated management. Pursue an integrated management approach for waterway projects that includes flood management, sea level rise, water quality protection, groundwater recharge, and ecosystem enhancement objectives.
Policy WR 6.2:	Region-wide permitting. The County should coordinate with applicable state, regional, and local permitting agencies to develop and implement a region-wide permitting program that will provide consistent watershed or regional implementation measures.
Policy WR 6.3:	Drainage problems. Consider drainage problems in the context of an entire watershed. Drainage and flood management plans should address property owner and developer responsibilities. These plans should use an integrated watershed approach that incorporates flood management, water quality, water supply, groundwater, and ecosystem protection and enhancement objectives on a watershed/basin scale.
Policy WR 6.7:	Areas prone to flooding. Develop a public information and education program in areas of the county prone to flooding and drainage problems to discourage new development in those areas and to inform residents and property owners about how to deal with drainage and flood control problems, use best management practices, and get assistance.

Land Use Element

The Land Use Element of the County's General Plan is one of the required general plan elements by the state. The principle consideration in this element is the physical setting of the county. This element describes the official County policy on the location of land uses and ensures orderly growth and development. This element is written in coordination with the circulation element in order to correlate future land use with transportation infrastructure. The policies within the Land Use Element work directly with the County's Land Use Ordinance to provide comprehensive development standards and review procedures.

The Land Use Element is divided into four major chapters: Framework for Planning, the area plans, the community/village plans, and the official maps. For planning purposes and due the size and diversity of topography and climate throughout, the county has been divided into the Inland Area and the Coastal Zone. Both of which have separate Framework for Planning documents, area plans, and community plans tailored to those areas of the county. Each Framework of Planning document assists the County Planners when reviewing development or land division proposals by explaining the criteria in applying land use categories, combining designations and the Resource Management System to ensure future growth and development takes places in areas and in a manner that will not harm current or future residents.

6.1.2 Combining Designations

Combining designations are special map categories that identify areas of potential hazards or public value that should be taken into consideration when proposing new development and when reviewing applications for development. Each Framework for Planning document explains the purpose of the combining designations with a list of items specific to the Inland Area and Coastal Zone, both explain the following as one of the purposes of the designation, "To reduce risks to life and property through proper location and design of structures within areas subject to man-made or natural hazards, such as: airports; flooding; or geologic hazards, including active faulting, land sliding, or liquefaction."

There are ten (10) combining designations in the Inland Area and fourteen (14) in the Coastal Zone. Each designation has specific purposes and development standards to help mitigate the risk of the hazard for proposed development. The following combining designations are specific to hazards profiled in this plan were taken from the Framework for Planning documents:

Geologic Study Area (GSA): Applied to: areas identified in the Alquist-Priolo Geologic Hazard Zones Act as "Special Studies Zone" (Public Resources Code Section 2622); to areas within urban and village reserve lines subject to "moderately high to high" landslide risk or liquefaction potential (as identified in the geologic and seismic hazard section of the Safety Element of the county general plan); and to lands outside urban reserve lines subject to high landslide risk potential (also according to the geologic and seismic hazard section of the Safety Element).

Flood Hazard (FH): Applied to flood-prone areas identified through review of available data from various federal, state, or local agencies. Also includes flood elevations of existing lakes and reservoirs.

Sensitive Resource Area (SRA): Applied to areas having high environmental quality and special ecological or educational significance. (Note, the following is only applicable in the Coastal Zone): The SRA includes four types of Environmentally Sensitive Habitats: Wetlands, Coastal Streams and Riparian Vegetation, Terrestrial Habitats and Marine Habitats.

The following combining designations are only applicable to the Inland Area:

TDCS Transfer of Development Credits Sending Site: Applied to areas where a landowner has met the criteria and standards of the Land Use Ordinance for TDC Sending Sites and has entered into an easement that qualifies under either the Open Space Easement Act or the Conservation Easement Act granted to a qualified public or private non-profit organization created for the purposes of protecting and managing resources, that restricts the development potential of the property. May also apply to community-based TDC programs, (as set forth in Chapter 6 of

Framework for Planning) identified through an area or community/village plan update or by request of the area property owners. [Added 1996, Ord. 2776]

TDCR Transfer of Development Credits Receiving Site: Applied to areas where a landowner has met the criteria and standards of the Land Use Ordinance for TDC Receiving Sites and where a tentative map requiring the use of TDCs has been approved and recorded. May also apply to community-based TDC programs, (as set forth in Chapter 6 of Framework for Planning) identified through an area or community/village plan update or by request of the area property owners. [Added 1996, Ord. 2776]

6.2 San Luis Obispo County's Administrative and Technical Mitigation Capabilities

The following County Departments have existing capabilities that are currently being used or could be used in planning for hazard mitigation projects. Other departments not listed here that have hazard specific capabilities are listed under subsection 6.4 Hazard Specific Mitigation Capabilities of this section. Table 6-14 below identifies the County personnel responsible for activities related to mitigation and loss prevention in San Luis Obispo County.

6.2.1 Department of Planning and Building

The San Luis Obispo County Department of Planning and Building is the County's land-based department. This department is responsible for a wide variety of programs and activities related to planning, zoning, permits, water conservation, stormwater, energy and housing for the unincorporated portion of the County of San Luis Obispo. Staff often take natural hazards into consideration when reviewing development applications and updating the County land use plans, as the Department is responsible for applying the County's Land Use Code, General Plan, and Building Code to each land use and construction permit application. The Department's mission is to promote "the wise use of land and helping to build great communities".

6.2.2 Office of Emergency Services

The County Office of Emergency Services (OES) coordinates planning and preparedness, response and recovery efforts for disasters occurring within the unincorporated area of San Luis Obispo County. OES has the mission of serving the public before, during and after disasters. The Office communicates and coordinates with all levels of government and many other entities in order to minimize the impact of disasters and enable affected communities to return to pre-disaster conditions as soon as possible. OES is responsible for public outreach related to hazards, including educating the public on preparedness and mitigation actions, this information can be found on the County's website ReadySlo.org. The Office is also responsible for the public alert and notification systems to notify the public during an emergency.

Various emergency plans have been developed and implemented by OES, some of which are described in further detail in subsection 6.4 Hazard Specific Mitigation Capabilities. These emergency plans include: The County Emergency Operations Plan (EOP), Earthquake Emergency Response Plan, Dam and Levee Failure Plan, Hazardous Materials Response Plan, Recovery Plan and Tsunami Response Plan.

6.2.3 Environmental Health Services Division

Environmental Health is a division of the County Public Health Department with the mission of providing a safe and healthful environment for all unincorporated areas of San Luis Obispo County. The Division maintains geospatial data and utilizes GIS including web map viewers to share information related to the assessment of proposed water well sites, beach water quality, and mosquito surveillance trapping sites which include the identification and counts of mosquito species. The Environmental Health Division also provides the following services related to hazards and hazard mitigation:

Disaster Preparedness and Emergency Response Program – The Division is responsible for providing information related to water quality, food safety, sewage disposal, indoor air pollution, fire recovery and cleanup and other guidance that can be leveraged to protect public health during a disaster or emergency.

Land Use Program – A required review by the Division with referral from the Planning and Building Department. The purpose of the program is to prevent health hazards and mitigate, where possible environmental degradation as a result of improperly planned development projects. The primary focus is water quality and availability.

CUPA Program (Hazardous Materials and Waste) – The Environmental Health Division is the County's Certified Unified Program Agency (CUPA) which applies the state regulatory standards and programs related to hazardous materials. Refer to subsection 6.4 and the Hazardous Materials Capabilities subsection for more information related to the specific programs with the County's CUPA Program.

6.2.4 Public Works Department

The San Luis Obispo County Public Works Department is comprised of twelve divisions. The Department has the overall responsibility for the maintenance of all county roadways and bridges, engineering review of proposed land developments, the administration and operation of various water and waste water facilities, long term master water planning, and the facility planning, design, and construction management of all County building projects. The Public Works Department is also charged with the development and implementation of the County's five-year Capital Improvement Plan.

Table 6-14 San Luis Obispo County's Administrative and Technical Mitigation Capabilities

Personnel Resources	Yes/No	Department/Position
Planner/engineer with knowledge of land development/land management practices	Y	Planning and Building Department/Planning and Engineering Staff
Engineer/professional trained in construction practices related to buildings and/or infrastructure	Y	Planning and Building Department/Building Staff
Planner/engineer/scientist with an understanding of natural hazards	Y	Public Works, Planning and Building Department, Ag Department/Planning, Engineering, and Environmental Specialist Staff
Personnel skilled in GIS	Y	Information Technology Department/GIS Analysts
Full time building official	Y	Planning & Building Department/Chief Building Officer



Personnel Resources	Yes/No	Department/Position
Floodplain manager	Y	Public Works/Water Resources Engineer
Emergency manager	Y	Office of Emergency Services/Emergency Services Coordinator
Grant writer	Y	Office of Emergency Services/ Emergency Services Coordinator; Planning and Building Department/Planning Staff; Public Works/Engineering Staff; Public Health/Program Managers; Environmental Health Services/Program Managers
Other personnel	Y	County Health Officer, Public Health Dept.
GIS Data Resources (Hazard areas, critical facilities, land use, building footprints, etc.)	Y	Information Technology Department/GIS Analysts; Ag Commissioner, Assessor's Office; Environmental Health, Planning and Building, Public Works
Warning Systems/Services (Reverse 9-1-1, cable override, outdoor warning signals)	Y	Reverse 9-1-1; Early Warning System Sirens; Emergency Alert System; Wireless Emergency Alerts, NOAA Weather Radio; Social Media; Route Alerting
Other	Y	Subdivision Review Board; Evacuation Assistance List and Registration; Fire Safe Council; County Drought Task Force; Resource Management Administration; CUPA Program

6.2.5 Local Boards, Commissions, Committees

There are a number of local boards, commissions, and committees in San Luis Obispo County. Those that have responsibilities related to hazard mitigation are described briefly below.

- **Board of Supervisors** – The Board of Supervisors (BOS) is the legislative body of the County responsible for setting policies and priorities that serve the County's needs. The BOS is made up of five members who are each elected by five districts of approximately equal population to overlapping four-years terms. The BOS holds bi-weekly televised broadcasts of Board meetings to reach and inform as many citizens as possible.
- **Planning Commission** - This commission is charged with the review and approval or denial of discretionary land use permits. The Commission is also advisory to the Board of Supervisors on proposed amendments to the General Plan and the Zoning Ordinance.
- **Agricultural Liaison Advisory Board (ALAB)** – This advisory board to the Board of Supervisors is the forum for the discussion of local agricultural and land use matters as directed by the Board of Supervisors. The ALAB board is comprised of the following members: one representative from each Supervisorial district; SLO County Farm Bureau representative; Agricultural Finance representative; Environmental representative; Coastal San Luis Resource Conservation District (RCD) representative; Upper Salinas-Las Tablas RCD; SLO County Cattleman's Association Representative; Wine Grape industry representative; Vegetable industry representative; Nursery industry representative; Organic

Grower/Direct Marketing industry representative; Strawberry industry representative. As well as non-voting members include the UC Cooperative Extension Director and Agricultural Commissioner/Sealer.

- **Parks and Recreation Commission (PRC)** – An advisory group providing a link between Parks and Recreation Department, member of the County Board of Supervisors and the public. All five members are individually appointed by the Board member representing their district. The PRC advises Staff and the Board of Supervisors on park development issues, budget considerations, and community relations.
- **Water Resources Advisory Committee (WRAC)** – The WRAC advises the County Board of Supervisors on all policy decisions relating to the water resources of the San Luis Obispo County Flood Control and Water Conservation District. The Committee recommends specific water resource and water conservation programs, methods of financing water resource programs, and other programs concerning the objectives and purposes of the San Luis Obispo County Flood Control and Water Conservation District Act.

6.2.6 State and Federal Programs

A number of state and federal programs exist to provide technical and financial assistance to local communities for hazard mitigation. Some of the primary agencies/departments that are closely involved with local governments in the administration of these programs include:

- California Governor's Office of Emergency Services
 - State of California Multi-Hazard Mitigation Plan
- California Governor's Office of Planning and Research
- California Polytechnic State University (Cal Poly)
- California Department of Water Resources
- California Department of Forestry and Fire Protection
- California Environmental Protection Agency
- California Department of Fish and Game
- California Department of Transportation (Caltrans) (District 5)
- California Highway Patrol
- California State Parks and Recreation Department
- California State Lands Commission
- Federal Emergency Management Agency (Region IX)
- U.S. Army Corps of Engineers (Sacramento District/Los Angeles District)
- Bureau of Reclamation (South-Central California Region)
- USDA Forest Service (Los Padres National Forest)
- California State Farm Service Agency (Templeton)
- National Parks Service
- USDA Natural Resources Conservation Service (Templeton Field Office)
- U.S. Environmental Protection Agency (Region IX)
- American Red Cross (Central California Region)

Other resources that are present that could assist in disaster recovery include:

- California Military Department – California National Guard Camp San Luis Obispo and Camp Roberts

6.3 San Luis Obispo County's Fiscal Mitigation Capabilities

Table 6-15 identifies financial tools or resources that the County could potentially use to help fund mitigation activities.

Table 6-15 San Luis Obispo County's Fiscal Mitigation Capabilities

Financial Resources	Accessible/Eligible to Use (Yes/No)	Comments
Community Development Block Grants	Potentially	The County is recipient agency under a variety of CBDG programs. Grants received under programs are restricted to specific uses. The County could potentially apply for any hazard mitigation CDBG program.
Capital improvements project funding	Potentially	The County maintains reserves for capital projects. Use of reserves is subject to Board approval but could potentially be used for hazard mitigation.
Authority to levy taxes for specific purposes	Unlikely	Tax measures must be placed on ballot by BOS majority and if proceeds are dedicated to specific purposes are subject to supermajority (2/3) voter approval
Fees for water, sewer, gas, or electric services	Potentially	BOS can approve fees when a nexus exists to the payor receiving direct benefit
Impact fees for new development	Potentially	BOS can approve fees when a nexus exists to the payor receiving direct benefit
Incur debt through general obligation bonds	Unlikely	Measures for tax-supported debt issuances must be placed on ballot by BOS majority and if proceeds are dedicated to specific purposes are subject to supermajority (2/3) voter approval
Incur debt through special tax bonds	Unlikely	Measures for tax-supported debt issuances must be placed on ballot by BOS majority and if proceeds are dedicated to specific purposes are subject to supermajority (2/3) voter approval
Incur debt through private activities	No	
Withhold spending in hazard prone areas	No	



6.4 Hazard Specific Mitigation Capabilities

The following San Luis Obispo County capabilities are organized by the hazards they help to mitigate.

6.4.1 Adverse Weather Capabilities

In San Luis Obispo County, the County Agriculture Department works with growers following inclement weather however at this time does not alert growers of impending severe weather such as freeze, high winds and heavy rains.

6.4.2 Agricultural Pest Infestation and Plant Disease Capabilities

Pest Detection Program

The pleasant climate and the diversity of crops and landscape plants that appeal to residents of San Luis Obispo County also appeal to invasive and destructive insect pests and plant diseases. In 2012, over 4,800 San Luis Obispo County residents volunteered to help departmental staff search for exotic, destructive insects and pests that can spread plant diseases by participating in the pest detection trapping program. Over 3,900 traps were placed and moved in and out of yards throughout the county. Traps for exotic insects such as Mediterranean, Oriental, Mexican and Melon Fruit Flies, Asian Citrus Psyllid (ACP), Gypsy Moth, Japanese Beetle, Glassy-winged sharpshooter (GWSS) and Light Brown Apple Moth (LBAM) were checked 29,010 times by Pest Detection Trappers from the Agricultural Commissioner's office. This partnership with residents resulted a successful 2012 trapping season, with only LBAM found in localized quarantine areas in Los Osos and Cayucos.

Insect traps were placed in plant nurseries throughout the county for the detection of GWSS, LBAM, ACP and European Pine Shoot Moth. These 228 additional traps were checked 3083 times throughout the trapping season. Pest Detection Trappers placed 1700 traps in commercial vineyards for the detection of European Grapevine Moth (EGVM) and in croplands for the detection of LBAM. These traps were checked 12,224 times. None of the targeted insects were intercepted in the vineyard or cropland traps. Eradication efforts in Northern California have been successful in eliminating the threat of EGVM spreading to San Luis Obispo County.

Pest Exclusion Program

In order to protect agriculture and the environment from the introduction of pests that do not currently occur in San Luis Obispo County, staff intercepted, inspected, quarantined, excluded and destroyed incoming plant shipments infested with various kinds of harmful pests originating from across the United States and around the world. During 2012, of the 12,004 plant shipments held for inspection, 4,206 shipments were visually inspected and 51 were rejected for significant pest finds or other violations of California regulatory requirements.

Staff also examined 4,185 nursery shipments that originated from outside of the county, visually inspecting all but the lowest risk shipments for the presence of the glassy-winged sharpshooter. Due to the success of this statewide program, only one shipment arriving into San Luis Obispo County in 2012 was found to be infested with the Glassy-winged sharpshooter. This thorough inspection program has prevented the Glassy-winged sharpshooter from becoming established in our county, despite large populations in the southernmost portions of the state.

One small infestation within the city of San Luis Obispo in late 2010 has been contained and no additional insects have been detected since insecticide treatments in 2011. If no additional glassy-winged sharpshooters are detected during the 2013 growing season, this pest will be declared eradicated from San Luis Obispo County.

Pest Eradication

Pest eradication is designed to eliminate small populations of invasive pests that have become established in the county. Rapid response and long-term consistent follow-up are critical to an effective pest eradication project. Depending on the pest type, location and the technology available, an eradication plan may include mechanical, cultural, chemical, or biological means. Regardless of the technique, eradication efforts are generally long-term commitments.

Public Education and Outreach efforts

The San Luis Obispo County Fire Safe Council has issued articles and brochures on Sudden Oak Death and Pine Pitch Canker, both diseases that increase the potential for catastrophic fires.

The San Luis Obispo County Agricultural Commissioner's office and the University of California Cooperative Extension Farm Advisors keep agriculturalists, including production nursery operators, updated on efforts to prevent, detect and manage or eradicate agricultural pests.

6.4.3 Biological Agents (Naturally Occurring) Capabilities

Public Health Department

The County Health Officer (CHO) is authorized under the California Health and Safety Code to take measures as may be necessary to prevent the spread of communicable disease. Generally, actions may include: 1) Obtaining information pertaining to the incident, 2) Assessing the health risk to the community, 3) Notifying appropriate agencies, and 4) Coordinating disease prevention and control with community, local, regional, state and federal agencies. Should it be necessary, the CHO may also initiate isolation and/or quarantine measures within the county.

Enhanced disease surveillance, including accurate, reliable and timely disease reporting and investigation are crucial to early detection of a naturally occurring infectious disease. The Public Health epidemiologist routinely investigates and records the causes and distribution of disease and disability within the County. Use of the existing centralized reporting system will help ensure coordinated and timely epidemiological investigation of disease occurrence.

6.4.4 Coastal Storm Capabilities

Development along the San Luis Obispo County coast is regulated by the standards and policies established in the Coastal Zone Land Use Ordinance (Title 23). All proposed development applications on the coast is reviewed in coordination by the Coastal Commission and the County Planning and Building Department. Development is not permitted near the top of eroding coastal bluffs. San Luis Obispo County will require coastal bluff erosion studies to determine the rate of erosion and the resulting safe distance from the top of the bluff for development.

6.4.5 Dam Failure Capabilities

Dam and Levee Failure Evacuation Plan (2016)

The Dam and Levee Failure Evacuation Plan is an annex to the County's Emergency Operations Plan and contains information specific to the actions that will need to be taken in the event of a dam or levee failure. The Plan sets forth guidelines and checklists for initial and general emergency management response, and EAS warning message specific to each dam and levee identified in the plan. The Evacuation Plan also include a hazard assessment in which it describes the area dams and levees and the overall potential effects of each one failing.

6.4.6 Drought and Subsidence Capabilities

San Luis Obispo County Flood Control and Water Conservation District

The San Luis Obispo County Flood Control and Water Conservation District is administered by the County Board of Supervisors and Department of Public Works to address various water related issues in the County including flood control (described in more detail below under Flood Capabilities and in Annex S) and water resources management. The District is responsible for collecting and monitoring data from stream and rain gauges, groundwater wells, and reservoirs to support the County's water resource planning efforts. The District manages both regional planning efforts for groundwater, watershed and water infrastructure resiliency, and for specific operations such as the Nacimiento Water Project, State Water Project, Lopez (Zone 3) System, and Los Osos Wastewater Recycling Facility. During the 2015 drought the District provided community resources describing water restrictions and tips for conserving water.

The Water Resources Advisory Committee (WRAC) advises the County Board of Supervisors on water resources policy decisions related to the District including determining needs and financial capabilities. The WRAC also recommends specific water resource and water conservation programs and methods of financing those programs to the County Board of Supervisors.

Regional Water Management Group (RWMG)

The San Luis Obispo County methods of financing water resource programs (RWMG) is a collaboration of twenty-nine local agencies and nonprofit organizations responsible for developing and implementing the Integrated Regional Water Management (IRWM) plan. IRWM planning efforts are intended to address all aspects of water resources in the San Luis Obispo County region. The RWMG is comprised of various stakeholder groups that include incorporated cities, community service districts, special districts, nonprofit organizations, water purveyors, resource conservation districts, and other water resources stakeholders. The County Flood Control and Water Conservation District serves as the lead agency. The RWMG is currently in the process of updating the 2014 IRWM Plan, which will also include future updates to the County's Stormwater Resource Plan (2018). The IRWM Plan, originally developed in 2005, was updated in 2014 to include more information related to water supply and drought events. The IRWM Plan identifies priority issues in the region and sets forth projects and programs to achieve the plans goals and objectives. The Plan is approved by the California Department of Water Resources and each participating member of the RWMG is responsible for adopting the Plan in order to eligible to receive future State grant funding.

Countywide Water Conservation Program

In response to a multi-year statewide drought and declining water levels in the Nipomo Mesa Water Conservation Area (part of the Santa Maria Groundwater Basin), Los Osos Groundwater Basin and the Paso Robles Groundwater Basin, the County Board of Supervisors adopted Resolution 2015-288 on

October 27, 2015 to establish the Countywide Water Conservation Program (CWWCP). The program was created to assist with water conservation within these basins. A key strategy of this program is to ensure all new construction and new or expanded agriculture will offset its predicted water use on other properties within the same basin. Each groundwater basin and conversation area have specific policies and programs to assist residents in meeting the offset requirements. Some of the programs include the cash for grass program, plumbing retrofit program, and a new construction program. The passing of Resolution 2015-288 also led to the adoption of several specific amendments related to water natural new development and water waste prevention within the following documents and ordinances:

- The Agricultural Element;
- The Conservation and Open Space Element;
- Title 8 (Health and Sanitation Code);
- Title 19 (Building and Construction Code);
- Title 22 (Land Use Ordinance); and
- Ordinance 3274 (County Fee Schedule)

Groundwater Sustainability Plans and Ground Water Sustainability Agencies

The 2015 Sustainable Groundwater Management Act (SGMA) is a comprehensive State law that sets the framework for a statewide, long-term sustainable groundwater management by local entities. Under SGMA, the California Department of Water Resources (DWR) designated priority for groundwater basins throughout the State as either high, medium, low, or very low. There are eight local priority groundwater basins and subbasins (collectively, “basins”) identified in San Luis Obispo County: Paso Robles, Atascadero, Arroyo Grande, Santa Maria, Los Osos, Warden Creek, San Luis Obispo Valley, and Cuyama Valley. SGMA requires that high or medium priority basins are required to form Groundwater Sustainability Agencies (GSAs) consisting of one or more local public agencies overlying the basin. GSAs must develop and adopt Groundwater Sustainability Plans (GSPs) to set forth strategies that will result in long-term groundwater sustainability. High or medium priority basins that are subject to critical conditions of overdraft must submit adopted GSPs by January 31, 2020. High and medium priority basins that are not subject to critical conditions of overdraft must submit adopted GSPs by January 31, 2022. GSAs have been established for each high and medium priority basin in the County and are in the process of developing their GSPs.

The GSAs for the Paso Robles and Cuyama basins (both high and subject to critical conditions of overdraft) are anticipated to complete and adopt their respective GSPs by the end of 2019. The GSAs for the San Luis Obispo Valley basin (high and not subject to critical conditions of overdraft) are anticipated to complete and adopt their GSP by the end of 2021.

SGMA does not apply to the portions of the Los Osos and Santa Maria basins that are under adjudication, and as a result these basins (including fringe areas outside of the adjudicated areas) are designated very low priority. The Warden Creek, Arroyo Grande, and Atascadero basins are designated very low priority following the recent boundary modification and prioritization processes. As a result, these five basins are no longer subject to the requirements of SGMA.

6.4.7 Earthquake Capabilities

The Great California ShakeOut, 2018

The Great California ShakeOut is an annual statewide earthquake drill to prepare citizens on what actions to take in the event of an earthquake. On October 18th, 2018 at 10:18 a.m. individuals throughout San Luis

Obispo practiced *Drop, Cover and Hold on* and stayed in that position for 60 seconds, as if a large earthquake had just occurred. The goal of the drill is to prepare California for major earthquakes and inform citizens on what to do before, during and after an earthquake. The California ShakeOut is held the third Thursday of October and every year local governments and individual citizens have the opportunity to participate. The 2019 Great California ShakeOut will take place on October 17th; approximately 3,044 participants in San Luis Obispo County are registered to participate in 2019.

Earthquake Emergency Response Plan (2015)

San Luis Obispo County Earthquake Emergency Response Plan is a component of the County's Emergency Operations Plan and establishes the procedures, policies and organizational response to an earthquake event that affects the county. Similar to other emergency response plans in the county the most applicable section to hazard mitigation is the hazard assessment section. This section identifies past earthquake events that have affected the county and describes each active or potentially active faults that are capable of producing damaging earthquakes. Within this section the Plan also identifies the potential effects of a damaging earthquake including secondary hazard events such as hazardous materials incidents, nuclear power plant failure and dam failure.

Uniform Code for Building Conservation – Title 19

In 1987 The California legislature passed Senate Bill 547, which required all cities and counties located in Seismic Zone 4, which the County of San Luis Obispo is part of, to conduct an inventory of potentially hazardous structures, including unreinforced masonry buildings. To comply with the requirements of SB 547, the County of San Luis Obispo adopted the Uniform Code for Building Conservation as part of Title 19 (Building and Construction Ordinance) of the County Code. Surveys that were conducted to identify potentially unsafe unreinforced masonry buildings identified about 80 structures that required modifications to meet specified earthquake resistance structural standards. Identified structures that require seismic retrofit are generally located in various areas, mostly urban. The County's ordinance implementing SB 547 requires the owners of identified unreinforced buildings to demolish the structures or complete modifications, depending upon the building's use and number of occupants. As of June 2018 only four structures remain on the URM registry (See details in subsection 5.3.7).

6.4.8 Flood Capabilities

National Flood Insurance Program (NFIP)

The goals of the NFIP are to reduce future flood damage through floodplain management, and to provide people with flood insurance. Community participation in the NFIP is voluntary. The County has participated in the NFIP since 1975. The County and municipalities continue to maintain full compliance with the NFIP. The ways in which each municipality and the County participate in the NFIP are described in further detail in the Flood section of the HIRA section and each jurisdiction's annex. Continued compliance is also described in Section 7 Mitigation Strategy. Specifics on flood insurance policies and repetitive loss properties are described in 5.3.8.

The County is taking action to:

- Strictly enforce flood hazard regulations both current and revised. FEMA regulations and other requirements for the placement of structures in flood plains shall be followed.
- Maintain standards for development in flood-prone and poorly drained areas.

- Establish mitigation for new development impacts on flooding.
- Identify areas known to be prone to flooding, such as Los Osos, Avila Valley, Santa Margarita, Cambria, Oceano and Templeton by developing community drainage studies. Seek stakeholder involvement in developing funding mechanisms and in acquiring grants to implement listed flood control improvements.
- Fire, Public Works, and law enforcement agencies will maintain and improve their ability to respond to water hazard emergencies throughout the County.
- Outline the needs for mapping of high-risk areas of the County.
- Participate in the flood insurance program.

Develop Flood Control Zones and assessment districts to finance capital projects and provide for on-going maintenance of facilities and waterways. **Community Rating System (CRS):** An additional indicator of floodplain management capability is the active participation of local jurisdictions in the CRS. The CRS is an incentive-based program that encourages counties and municipalities to undertake defined flood mitigation activities that go beyond the minimum requirements of the NFIP, adding extra local measures to provide protection from flooding. All of the 18 creditable CRS mitigation activities are assigned a range of point values. As points are accumulated and reach identified thresholds, communities can apply for an improved CRS class. Class ratings, which run from 10 to 1, are tied to flood insurance premium reductions. As class ratings improve (decrease), the percent reduction in flood insurance premiums for NFIP policy holders in that community increases. The cities of Morro Bay and San Luis Obispo participate in the CRS, though the five other incorporated cities and County do not.

The San Luis Obispo County Land Use Ordinance and Coastal Zone Land Use Ordinance (Titles 22 and 23 of the County Code)

The Land Use Ordinance for the Inland Area and Coastal Zone provide standards for the preparation and submittal of drainage plans for new development. These regulations specify when drainage plans are required, the contents of an adequate drainage plan, drainage standards, and the plan review and approval process. The Land Use Ordinance for both areas of the county contains the County's Floodplain Ordinance, which specifies development standards for areas that have a Flood Hazard (FH) combining land use designation. The development standards contained in the Floodplain Ordinance pertain to land use permit processing and construction standards for new development located in areas that have the potential to be inundated by a 100-year flood.

Flood Control and Water Conservation District

The San Luis Obispo County Flood Control and Water Conservation District (District) was established in 1945 with the purpose "to provide for control, disposition and distribution of the flood and storm waters of the district and of streams flowing into the district..." In 1968, Resolution No. 68-223 was adopted and defined the policy role of the District relating to the costs of planning, design, construction, operations and maintenance of drainage and flood control facilities. In accordance with Resolution 68-223, the District cannot be responsible for direct funding of community specific mitigation improvements. The District uses its general funding to identify flooding problems, recommend solutions, and help local areas implement recommended solutions. The District has developed a model on how to approach these important water resource issues, including steps on how to integrate solutions for multiple benefits and community acceptance.

In 2016, the District Board of Supervisors adopted Resolution No. 2016-281 to update the 1968 policy, including provisions related to financing for implementation projects with respect to changes in California law such as Proposition 218. The policy update also includes identifying the broad range of services provided or anticipated to be provided by the District to help achieve sustainable water resources in all areas of the County.

The District, through the County Public Works Department, develops flood control projects that could protect life and property from flood hazards through community involvement and establishing funding mechanisms. The District has the authority to maintain and construct flood control improvements on major drainage facilities located throughout the County when specific flood control zones are established.

The District has a regional role in the County and can work with individual cities or communities when requested. More information on the District can be found in Annex S.

6.4.9 Hazardous Materials Capabilities

Hazardous Materials Emergency Response Plan (2013)

The San Luis Obispo County Hazardous Materials Emergency Response Plan provides information related to the response and responsibilities of county departments in the event of a hazardous materials incident. The Plan is written with the intent that it will be read and learned prior to hazardous materials emergency.

CUPA Program

The Environmental Health Division under the County of San Luis Obispo Public Health Department is the County's Certified Unified Program Agency (CUPA) which applies the state regulatory standards and programs related to hazardous materials. The following are there are seven (7) hazardous materials programs under the County's CUPA Program:

- Aboveground Petroleum Storage Tank Program
- California Accidental Release Prevention Program
- Hazardous Materials Business Plan Program
- Hazardous Waste Generator Program
- Household Hazardous Waste Disposal
- Tiered Permitting Hazardous Materials/Waste Program Permit
- Underground Storage Tank Program

Public Outreach and Education

The County Office of Emergency Services (OES) in collaboration with Pacific Gas & Electric (PG&E) produce an annual Emergency Planning Calendar that is mailed to businesses and residences within the Diablo Canyon Emergency Planning Zone as well as available to view online. The calendar provides the following information:

- How to prepare for a potential emergency at the Diablo Canyon Power Plant,
- what to do during an emergency, public alert and notification system,
- What to do if you hear the warning sirens, evacuation information,
- School relocation information,
- Sheltering place information,
- Possible effects to agricultural products in the region,

- A map and explanation of the emergency planning zones,
- An explanation of government response and contacts information.

The calendar also provides information for those you do not have transportation to evacuate as well as an "Evacuation Assistance Card" to be filled out and returned to OES by individuals who are unable to evacuate themselves due to a disability or medical need.

6.4.10 Landslide Risk Reduction Capabilities

The California Building Code, which has been adopted by all seven cities and the County of San Luis Obispo, requires that site specific investigations be performed for development located in hillside areas. Investigations and practices typically required for hillside development include the following:

- Conduct thorough geologic/geotechnical studies by qualified geotechnical engineers and engineering geologists.
- Require both engineering geologists and geotechnical engineers during construction to confirm preliminary findings reported during initial studies.
- Require certification of the proposed building site stability in relation to the adverse effects of rain and earthquakes prior to the issuance of building permits.
- Mandate coordination between the civil engineer and the project engineering geologist and geotechnical engineer during construction grading.
- Require mitigation of on-site hazards caused by grading that may affect adjoining properties, including erosion and slope instability.

The County acknowledges that areas of known landslide activity are generally not suitable for residential development. The County will avoid development in areas of known slope instability or high landslide risk when possible and continue to encourage that development on sloping ground use design and construction techniques appropriate for those areas. More stringent slope stability criteria, or dynamic stability analysis, may apply to improvement design under the jurisdiction of some agencies.

6.4.11 Tsunami Capabilities

County programs related to tsunamis include: working with Federal and State agencies to better understand and prepare for the hazard of tsunamis and to improve the ability to respond to tsunami warnings provided by NOAA's West Coast and Alaska Tsunami Warning Center.

March 25th-29th, 2019 was Tsunami Week in San Luis Obispo County. This was an opportunity for the County to share information with the people and organizations on how to prepare for and understand the warning signs of a tsunami event. During this week the National Weather Service conducted a test of the Emergency Alert System (EAS) and NOAA Weather Radio All Hazards.

As of 2019 the County is installing Tsunami evacuation signage as a result of the implementation of an action in the 2014 version of this HMP.

Tsunami Emergency Response Plan (2016)

This Plan is an annex to the County's Emergency Operations Plan and contains information specific to the actions that will need to be taken in the event of being notified of a possible tsunami or in the event of an actual tsunami along the County's coastline. Section two of the Response Plan is the Hazard Assessment

which includes analysis on the hazard potential, inundation mapping, and potential warning challenges in the event of a tsunami.

6.4.12 Wildfire Capabilities

CAL FIRE/San Luis Obispo County Fire Unit Strategic Fire Plan (2018)

The County's Fire Unit Strategic Fire Plan assess the fire situation within the SLO County Fire Unit and explains the preparedness and firefighting capabilities within each division of the Fire Unit. The development of the Plan included local stakeholders to help identify priorities and strategic areas for pre-planning and fuel treatment. The Unit Fire Plan is updated annually and is developed to work cohesively with the CAL FIRE/San Luis Obispo County Fire Departments Service Level Analysis and the California Fire Plan. The Plan identifies six (6) Planning Areas to facilitate localized pre-fire planning efforts and explain priority WUI areas within the Planning Areas that would benefit from fuel reduction or pre-fire planning efforts.

The Plan further identifies pre-fire management strategies and tactics for each Planning Area. Pre-fire management strategies are, "all activities undertaken by county land managers, property owners, agencies and fire departments to reduce the risk of wildfire and resulting suppression costs..." (CAL FIRE, 2018). These management strategies focus on the four functions within the County Fire Unit which include, fire prevention (fire codes, design, construction and engineering practices for planning a fire safe community), engineering and structure ignitability, fire information and education and vegetation management. The pre-fire management tactics the Plan identifies are tactics employed by CAL FIRE/SLO through multiple scalable programs to be implemented countywide or at the community level. These tactics include opportunities for fire prevention and engineering tactics which can be integrated into existing planning mechanisms such as the County General Plan, County Municipal Code and Building Plans Reviews and Inspection Program.

Appendix A of the Plan lists all CAL FIRE/SLO County Fire Unit Pre-Fire Projects including the Planning Area, status, estimated completion date, project type and net acres. The comprehensive information provided in the CAL Fire/San Luis Obispo County Fire Unit Plan helps to inform other pre-fire planning efforts including county and municipality CWPPs, Fire Danger Operating Plan, County Fire Service Level Analysis, Central Coast Operating Plan, and Wildland Pre-Attack Plans.

Community Wildfire Protection Plan (CWPP) (2019)

The overall goal of the San Luis Obispo County's Community Wildfire Protection Plan is to "provide a county level strategic planning level framework for hazardous fuel assessment and reduction within San Luis Obispo County so that structures and assets are provided additional protection, reducing the potential of ignition" (San Luis Obispo, 2019). The plan addresses fire protection efforts to minimize the risk to watersheds, communities, assets, firefighters and the public throughout the County. The CWPP was developed to work together with the California Fire Plan and in collaboration and coordination with the San Luis Obispo County fire agencies, County Fire Council and various stakeholders. The plan identifies strategic measures to reduce vulnerabilities, public education and outreach strategies, and identifies fuel reduction goals and techniques while recognizing the variation in fuels, weather, topography, community and agency priorities throughout the County. The CWPP discusses Cooperative Assistance between the County fire agencies and list existing the automatic and mutual aid agreements between fire agencies. The CWPP is a living document that is managed and updated routinely by the fire agencies and Fire

Council. The County's CWPP serves as the foundation document for all local community wildfire protection plans and their wildfire mitigation projects set forth in those plans.

Firewise Communities

The Firewise USA® program provides a framework for communities to learn how to adapt to living with wildfire, including providing a framework for neighbors in a community to work together and be empowered to reduce risks to wildfire at the local level. The following communities in the County of San Luis Obispo that are certified Firewise communities.

- Ranchita Estates, Arroyo Grande
- Cambria
- Lake Nacimiento, Paso Robles
- Heritage Ranch HOA, Paso Robles

In addition to the communities listed above, Cabrillo Estates a community in Los Osos met with Cal Fire/SLO County Fire Department and SLO County Fire Council to discuss becoming a Firewise Community.

Fire Prevention Ordinances

Several local ordinances direct fire prevention activities within San Luis Obispo County.

These include Chapter 19.20, Construction Standards of Title 19, of the County Code; as well as Section 22/23.05.050 of the Land Use Ordinance and Coastal Zone Land Use Ordinance. These sections of Titles 22 and 23 contain standards pertaining to the preparation and review of fire safety plans, fire safety standards, site access, and driveway requirements. In addition, the California Fire Code has been adopted by San Luis Obispo County with amendments as part of County Ordinance Title 16.

California Fire Code

This code may be adopted by local jurisdictions, with amendments, and provides minimum standards for many aspects of fire prevention and suppression activities. These standards include provisions for access, water supply, fire protection systems, and the use of fire-resistant building materials.

California Health and Safety Code and the California Building Code

The Health and Safety Code provides regulation pertaining to the abatement of fire related hazards. It also requires that local jurisdictions enforce the California Building Code, which provides standards for fire resistive building and roofing materials, and other fire-related construction methods.

Title 19 of the California Code of Regulations: These regulations pertain to fire prevention and engineering measures for State Fire Marshal regulated occupancy.

Public Resources Code and Title 14 of the California Code of Regulations: The Public Resources Codes

(PRC) 4290 and 4291 are State laws that have a significant impact on the prevention of large losses of life and property in the wildland/urban intermix areas from a destructive wildfire. The intent of these codes is to require new development in wildfire prone areas to be built with adequate road access, water for firefighting, addressing, fire resistive construction, and vegetation clearance. The code also requires the owners to maintain an adequate defensible space around their buildings from an approaching fire. These

laws are an important component in the land use approval process in the County as well as in enforcement by the fire department.

Assembly Bill 337 (Bates Bill)

In response to the Oakland Hills fire of 1991, this bill was passed in 1992 and requires brush clearance and fire-resistant roof material (Class A or B) to be used on all new construction that is located in areas designated as being a “Very High Fire Hazard Severity Zone”. This applies mostly to the unincorporated areas; Atascadero is the only city in the County that has an area designated as a Very High Fire Hazard Severity Zone.

San Luis Obispo County Community Fire Safe Council

In addition to the measures outlined above to prevent and best respond to fires, the County has undertaken a variety of mitigation activities including an aggressive inspection program, a Countywide Community Fire Safe Council, a vegetation management program, completing the removal of fuel through a chipping program, creation of community separators and pre-planning major wildfire scenarios in the high and very high fire danger areas (includes evacuation plans and pre-plans).

Fires impact an array of agencies, organizations and citizens known as stakeholders. These stakeholders are represented on the San Luis Obispo County Community Fire Safe Council. The purpose of the Council is to bring these representatives to the table to discuss solutions for the prevention and reduction of losses from fire. The primary objective and purpose of the San Luis Obispo County Community Fire Safe Council is to provide education, exchange information and foster fire prevention and fire safety within the County of San Luis Obispo. The San Luis Obispo County Community Fire Safe Council plays a vital role in the development and implementation and reviews all elements of the Fire Management Plan. This practice ensures buy-in from the stakeholders.

Mutual Aid Agreements

The California Department of Forestry and Fire Protection (CAL FIRE), U.S. Forest Service (USFS), and the Bureau of Land Management (BLM) have entered into mutual aid agreements for the purpose of wildfire protection in San Luis Obispo County. Mutual aid agreements are reciprocal arrangements in which fire protection agencies share personnel and equipment during emergency situations. Cities and fire protection districts are also participants in various mutual aid and auto aid agreements, including the State Master Mutual Aid Agreement.

Existing Fire Protection Services

Services to San Luis Obispo County are provided by the California Department of Forestry and Fire Protection (CAL FIRE) under contract to provide full service fire protection. CAL FIRE is responsible for the administration of the fire stations that serve the unincorporated areas of the County not within fire protection or other special districts and provides equipment and training for volunteer stations located throughout the county.

Risk Reduction Measures

A number of steps have been taken by San Luis Obispo County to reduce the potential for wildfires. Although these measures cannot eliminate the risk of wildfire related damages, they will help to



substantially reduce the associated risk. Wildfire hazard reduction measures generally include implementation by the County of the following precautions:

- Use fire resistant building materials and construction methods: Standards have been adopted to reduce the use of combustible building materials in high fire hazard areas. Standards for fire resistive building materials and construction methods are provided by the California Building Code (Chapter 7A), The California Fire Code (Chapter 47) and the Public Resources Code.
- Provide defensible space around structures: This broad measure as implemented in the County includes a number of specific actions that are taken to minimize wildfire risks. Providing a defensible space area around a structure serves a dual function of limiting fuel for the fire to approach the structure, as well as providing a position from which fire fighters can combat the blaze. Wildfire risk reduction and management practices enforced in the County include the removal or thinning of highly combustible vegetation, the use and maintenance of fire-resistant plantings, providing clearings around structures and other combustible materials, and the implementation of a variety of other fuel reduction and fire prevention/ suppression measures.
- Provide adequate water supply: Water that is used for fire suppression purposes, and the pressure under which it is delivered, is referred to as "fire flow." The fire flow that would be required for a specific development is dependent upon a variety of factors, including the type of construction, the use or occupancy of the structure, and the location of surrounding structures. For residential development, the County determines adequate fire flow ranges to be a minimum of 1,000 gallons per minute at 20 psi, for a minimum of two hours.
- Provide adequate access: Adequate access to structures includes providing roadways that are passable by large fire-fighting equipment. This requires roadways to have adequate widths, as well as gradients, bridges, and turn-around areas that accommodate fire trucks.

6.4.13 Climate Change Capabilities

The County has acknowledged that climate change is occurring and has continued to plan for it. The County's mitigation strategy in Section 7 has two climate change related mitigation actions that are continuing from the previous mitigation action plan:

- C.7.2 (formally 10.D) Support Efforts to reduce greenhouse gas emissions.
- C.7.4 (formally 10.B) Continue to promote energy efficiency and renewable energy within the County to reduce peak load demand.

The HMPC gave the following updates for these actions related to energy efficiency, renewables and energy storage and other efforts:

Energy Efficiency

- Implemented two phases of the Sustainable Turnkey Solutions project with PG&E, which is estimated to reduce County energy consumption by over ten percent.
- Implemented exterior lighting energy efficiency project at El Chorro Park.
- Implemented personal computer power monitoring software on Public Works' computers.
- Implementing two lighting energy efficiency projects at 1087 Santa Rosa in SLO and at the Los Osos Sheriff Substation. (current status: ordering equipment for installation)
- Developing mechanical energy efficiency projects at three Park sites
- Auditing fourteen sites for energy efficiency opportunities to consider for next fiscal year.

Renewable & Energy Storage

- Implemented ground-mounted solar photovoltaic system at Creston Fire Station.
- Approved two Energy Service Agreements for solar photovoltaic carport canopies at Dept. of Social Services and dairy Creek Golf Course parking lots. (current status: preconstruction)
- Audited ten sites for renewable energy and energy storage opportunities.
- Developing solar photovoltaic systems and battery storage projects at six County sites (County Operations Center, Los Osos Wastewater Treatment Plant, Lopez Water Treatment Plant, Nacimiento booster stations)

Other

- Implemented software that allows for tracking energy use at County facilities.
- Trained five departments to date (Auditor-Controller-Treasurer-Tax Collector-Public Administrator, Parks and Recreation, Public Works, Drug and Alcohol Services, Planning & Building)
- Installing electrical submeters in downtown San Luis Obispo campus to track energy use by building (status: preconstruction)
- Formed County-wide stakeholder group to direct energy initiatives

Many of these County-facility projects were initiated and initially managed by the Department of Planning & Building's Energy Section but are now overseen and directed by the Department of Public Works Facilities Division. Other departments in the County have also made steps to educate the public on the potential effects of climate change. The County Public Health Department conducts public outreach through pamphlets and brochures on how climate change may lead to increased vulnerabilities related to community health.

6.5 Opportunities for Enhancement

The 2019 update provided the County an opportunity to review and update the capabilities currently in place to mitigate hazards. This also provided an opportunity to identify where capabilities could be improved or enhanced. Specific opportunities could include:

Join the CRS: The County may consider joining the Community Rating System to improve flood insurance affordability, public flood hazard notification, and enhanced floodplain management. The County is already going above and beyond some of the minimum NFIP standards by requiring a one foot above base flood elevation freeboard requirement for all new structures permitted in flood hazard areas. The County can get credit for this and potentially lower the cost of flood insurance for residents in the unincorporated areas. A mitigation action specific to exploring the cost/benefit of the CRS has been added to this plan's mitigation strategy.

Become a Tsunami Ready Community: The County is in process of becoming tsunami ready as of 2019. This has been a work in progress, and requires overcoming issues with installing signage within Caltrans encroachments.

Training: Provide training opportunities to help inform County staff on how best to integrate hazard information and mitigation projects into their departments.

Encourage Additional Firewise Communities: San Luis Obispo County Fire/Cal Fire could continue to help the number of Firewise communities grow and build resilience to wildfires.

Alignment of General Plan Safety Element and related policies with SB 2911 and SB 1241 and pending Cal FIRE Fire Hazard Severity Zone map updates: Recent state legislation is requiring additional fire safe building practices, and pending changes/updates in the Cal Fire FHSZ maps may impose additional requirements in areas potentially prone to wildfire. Effective January 2019 SB 2911 requires parcels in Very High Severity Zones to have fire safe design. The County should review updated maps and update policies to align with the new legislation.



SECTION 7 MITIGATION STRATEGY

DMA Requirement §201.6(c)(3):

[The plan shall include] a mitigation strategy that provides the jurisdiction's blueprint for reducing the potential losses identified in the risk assessment, based on existing authorities, policies, programs and resources, and its ability to expand on and improve these existing tools.

This section describes the mitigation strategy process and mitigation action plan for the San Luis Obispo County Multi-Jurisdictional Hazard Mitigation Plan. It describes how the County and participating jurisdictions met the requirements for the following from the 10-step planning process:

- Planning Step 6: Set Goals
- Planning Step 7: Review Possible Activities
- Planning Step 8: Draft an Action Plan

The mitigation strategy reflects the results of the collaborative work of the HMPC. Subsection 7.3 Mitigation Action Plan is based on the updated planning process, risk assessment, capability assessment, goal setting, and the identification of mitigation actions 7.3. Taking all of these into consideration, the HMPC developed the following overall mitigation strategy:

- **Communicate** the hazard information collected and analyzed through this planning process as well as HMPC success stories so that the community better understands what can happen where and what they themselves can do to be better prepared.
- **Implement** the action plan recommendations of this plan.
- **Use** existing rules, regulations, policies, and procedures already in existence. Given the flood hazard in the planning area, an emphasis should be placed on continued compliance with the National Flood Insurance Program and participation by all communities in the Community Rating System.
- **Monitor** multi-objective management opportunities so that funding opportunities may be shared and packaged, and broader constituent support may be garnered.

7.1 Goals and Objectives

DMA Requirement §201.6(c)(3)(i):

[The hazard mitigation strategy shall include a] description of mitigation goals to reduce or avoid long-term vulnerabilities to the identified hazards

Up to this point in the planning process, the HMPC has organized resources, assessed hazards and risks, and documented mitigation capabilities. The resulting goals, objectives, and mitigation actions were developed based on these tasks. The HMPC held a series of meetings and exercises designed to achieve a collaborative mitigation strategy as described further throughout this section.

Over a series of meetings during the 2019 update process the HMPC reviewed the results of the hazard identification, vulnerability assessment, and capability assessment update. This analysis of the risk assessment identified areas where improvements could be made and provided the framework for the HMPC to update planning goals and objectives and the ultimate mitigation strategy for the San Luis Obispo County planning area.

Goals were defined for the purpose of this mitigation plan as broad-based public policy statements that:

- Represent basic desires of the community;
- Encompass all aspects of community, public and private;
- Are nonspecific, in that they refer to the quality (not the quantity) of the outcome;
- Are future-oriented, in that they are achievable in the future; and
- Are time-independent, in that they are not scheduled events.

Goals are stated without regard to implementation. Implementation cost, schedule, and means are not considered. Goals are defined before considering how to accomplish them so that they are not dependent on the means of achievement. Goal statements form the basis for objectives and actions that will be used as means to achieve the goals. Objectives define strategies to attain the goals and are more specific and measurable.

During the 2013-2014 planning process, the HMPC validated the goals and objectives from the 2005 plan.

During the 2019 plan update process, HMPC members review the existing goals and objectives as well the goals and objectives from each element of the County General Plan as well as the goals and objectives from each participating jurisdiction's previous hazard mitigation plan. The committee decided to delete the 2014 plan's goals 5, 6 and 7 which were as follows:

- Goal 5 - Minimize the level of damage and losses to people, existing and future critical facilities and infrastructure due to wildland fires.
- Goal 6 - Minimize the level of damage and losses to people, existing and future critical facilities and infrastructure due to geological events (earthquakes, landslides, and liquefaction).
- Goal 7 - Minimize the level of damage and losses to people, existing and future critical facilities and infrastructure due to tsunami events.

The primary reason was to move away from hazard-specific goals. With the deletion of the three goals the remaining goals were renumbered and, in some cases, revised completely. Based on the risk assessment review and goal setting process, the HMPC identified the following goals and objectives, which provide the direction for reducing future hazard-related losses within the San Luis Obispo County planning area.

The updated goals and objectives of this plan are:

Goal 1 – Promote understanding and support for hazard mitigation by key stakeholders and the public within San Luis Obispo County.

Objective 1.1: Educate key stakeholders and the public to increase awareness of hazards and opportunities for mitigating hazards

Goal 2 – Mitigate hazard impacts to existing and future development.

Objective 2.1: Limit new development in hazard areas, and as permissible, build to standards that will prevent or reduce damage.

Goal 3 – Build and support local capacity to address, and commitment to minimize, San Luis Obispo County's vulnerability to potential hazards through collaboration with the incorporated cities and special districts.

Objective 3.1: Improve existing capabilities to manage emergency situations.

Objective 3.2: Enhance the safety of the community.

Objective 3.3: Assure that at-risk populations and those with access and functional needs (AFN) are addressed in all plans and procedures.

Objective 3.4: Identify and collaborate on hazard mitigation projects that benefit multiple jurisdictions.

Goal 4 – Minimize the level of injury and loss of life and damage and to existing and future critical facilities, property and infrastructure due to natural hazards.

Objective 4.1: Enhance the ability of community assets so as to minimize damages sustained from potential hazards.

Objective 4.2: Develop a comprehensive approach to reducing the level of damage and losses due hazards through utilizing resilient community and critical infrastructure design, management, code enforcement, GIS mapping, improved policies, procedures, training evacuation planning, and planning processes.

Objective 4.3: In order to better protect life and property, acquire and develop more accurate, comprehensive countywide GIS data sets.

Objective 4.4: Minimize impacts from dam inundation.

Goal 5 – Minimize human morbidity and mortality as a result of biological agent threats.

Objective 5.1: Curtail the entry and spread of infectious diseases within San Luis Obispo County.

Goal 6 – Minimize the extent of damage and destruction to forests, crops, farm animals, humans, and existing and future facilities as a result of agricultural pests and disease.

Objective 6.1: Curtail the entry of harmful agricultural pests into San Luis Obispo County.

Objective 6.2: Quickly detect and eradicate pathogenic pests within the County. When eradication is not feasible, minimize spread.

Goal 7 – Adopt and implement strategies to enable the County to prepare for and adapt to the impacts of climate change through collaboration with the incorporated cities and special districts.

Objective 7.1: Minimize the harmful effects of climate change by identifying, assessing and preparing for impacts. Coordinate with the incorporated cities and special districts to implement strategies with regional significance.

7.2 Identification and Analysis of Mitigation Actions

DMA Requirement §201.6(c)(3)(ii):

[The mitigation strategy shall include a] section that identifies and analyzes a comprehensive range of specific mitigation actions and projects being considered to reduce the effects of each hazard, with particular emphasis on new and existing buildings and infrastructure.

In order to identify and select mitigation actions to support the mitigation goals, each hazard identified in Section 5 Hazard and Risk Assessment was evaluated. Only those hazards that were determined to be a priority hazard (high or medium significance ratings) were considered further in the development of hazard-specific mitigation actions.

These priority hazards are:

- Drought and Water Shortage (high)
- Earthquake (high)
- Wildfire (high)
- Adverse Weather: Thunderstorm/Heavy Rain/Hail/Lighting/Dense Fog/Freeze (medium)
- Agricultural Pest Infestation and Disease (medium)
- Biological Agents (medium)
- Dam Incidents
- Flood (medium)
- Landslides and Debris Flow (medium)
- Tsunami and Seiche (medium)
- Human caused: Hazardous Materials (medium)

The HMPC eliminated the hazards identified below from further consideration in the development of mitigation actions because the risk of a hazard event in the County is unlikely or nonexistent, the vulnerability of the County is low, or capabilities are already in place to mitigate negative impacts. The eliminated hazards are:

- Adverse Weather: High Wind/Tornado
- Adverse Weather: Extreme Heat
- Subsidence

It is important to note, however, that all the hazards addressed in this plan are included in the countywide multi-hazard public awareness mitigation action, or in jurisdictional-specific actions where these hazards may be a higher priority.

Once it was determined which hazards warranted the development of specific mitigation actions, the HMPC analyzed viable mitigation options that supported the identified goals and objectives. The HMPC was provided with the following list of categories of mitigation actions, which originate from the Community Rating System:

- **Prevention:** Administrative or regulatory actions or processes that influence the way land and buildings are developed and built.
- **Property protection:** Actions that involve the modification of existing buildings or structures to protect them from a hazard or remove them from the hazard area.
- **Structural:** Actions that involve the construction of structures to reduce the impact of a hazard.
- **Natural resource protection:** Actions that, in addition to minimizing hazard losses, also preserve or restore the functions of natural systems.
- **Emergency services:** Actions that protect people and property during and immediately after a disaster or hazard event.
- **Public information/education and awareness:** Actions to inform and educate citizens, elected officials, and property owners about the hazards and potential ways to mitigate them.

At the mitigation strategy meeting the HMPC was also provided with a matrix showing examples of potential mitigation action alternatives for each of the above categories, for each of the identified hazards. The HMPC was also provided a handout that explains the categories and provided further examples. Another reference document titled "Mitigation Ideas" developed by FEMA was distributed to the HMPC

via an online link. This document lists the common alternatives for mitigation by hazard. The HMPC was also instructed to consider both future and existing buildings in considering possible mitigation actions.

As part of the review of mitigation options long term climate change adaptation strategies were also discussed. HMPC members were encouraged to incorporate climate change adaptation measures into the mitigation strategy of their respective jurisdictions utilizing resources and guidance available on the Cal-Adapt website.

A facilitated discussion then took place to examine and analyze the options. Appendix B provides the matrix of alternatives considered. Each proposed new mitigation action was written on a large sticky note and posted on flip charts in meeting room underneath the hazard it addressed.

7.2.1 Prioritization Process

Once the mitigation actions were identified, the HMPC was provided with several decision-making tools, including 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? (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?

In accordance with the Disaster Mitigation Act requirements, an emphasis was placed on the importance of a benefit-cost analysis in determining action priority. Other criteria used to assist in evaluating the benefit-cost of a mitigation action included:

- Does the action address hazards or areas with the highest risk?
- Does the action protect lives?
- Does the action protect infrastructure, community assets or critical facilities?
- Does the action meet multiple objectives (Multiple Objective Management)?
- What will the action cost?
- What is the timing of available funding?

The mitigation categories, multi-hazard actions, and criteria are included in Appendix B: Mitigation Categories, Alternatives, and Selection Criteria.

At the mitigation strategy meeting the HMPC used STAPLEE to determine which of the identified actions were most likely to be implemented and effective. With these criteria in mind, team members were given



a set of four green sticky-dots. The team was asked to use the dots to prioritize projects with the above criteria in mind, essentially voting on the projects. The projects with the most dots became the higher priority projects. This process provided both consensus and priority for the recommendations. Follow-up meetings were held within each jurisdiction to finalize the actions that are part of this plan. Participating jurisdictions were given the leeway to prioritize the actions specific to them, using the previously mentioned criteria.

This plan also carries forward many mitigation actions developed during the 2014 planning process. HMPC members and jurisdictional planning teams were asked to review their existing mitigation actions and report on the progress made toward implementation and decide whether and incomplete actions should be carried forward for continued or future implementation or be deleted. In some cases, mitigation actions were adjusted to reflect new situations or priorities.

The process of identification and analysis of mitigation alternatives allowed the HMPC to come to consensus and to collectively prioritize recommended mitigation actions. During the voting process, emphasis was placed on the importance of a benefit-cost review in determining project priority; however, this was not a quantitative analysis. Benefit-cost was also considered in greater detail in the development of the Mitigation Action Plan detailed below in subsection 7.3. Specifically, each action developed for this plan contains a description of the problem and proposed project, expected project benefits, the entity with primary responsibility for implementation, a cost estimate, potential funding sources, and a schedule for implementation. Development of these project details for each action led to the determination of a High, Medium, or Low priority for each action.

Recognizing the limitations in prioritizing actions from multiple jurisdictions and departments and the regulatory requirement to prioritize by benefit-cost to ensure cost-effectiveness, the HMPC decided to pursue mitigation action strategy development and implementation according to the nature and extent of damages, the level of protection and benefits each action provides, political support, project cost, available funding, and individual jurisdiction and department priority. This process drove the development of a prioritized action plan for the San Luis Obispo County planning area. Cost-effectiveness will be considered in greater detail through a formal benefit-cost analysis when seeking FEMA mitigation grant funding for eligible actions associated with this plan.

7.3 Mitigation Action Plan

DMA Requirement §201.6(c)(3)(iii):

[The mitigation strategy section shall include] an action plan describing how the actions identified in section (c)(3)(ii) will be prioritized, implemented, and administered by the local jurisdiction. Prioritization shall include a special emphasis on the extent to which benefits are maximized according to a cost benefit review of the proposed projects and their associated costs.

This action plan was developed to present the recommendations developed by the HMPC for how the San Luis Obispo County planning area can reduce the vulnerability of people, property, infrastructure, and natural and cultural resources to future disaster losses. Over time the implementation of these projects will be tracked as a measure of demonstrated progress on meeting the plan's goals.

7.3.1 Progress on Previous Mitigation Actions

San Luis Obispo County have been successful in implementing actions identified in the 2014 LHMP Mitigation Strategy, thus, working steadily towards meeting the 2014 plan goals. During the 2019 plan update process the County and participating jurisdictions reported on the status of the 2014 actions through the use of a reporting tool. Each jurisdiction provided input on if the action had been completed, was deferred (not yet implemented, but still relevant for the updated plan), was in progress, or should be deleted. The results are captured in Table 7.1.

The 2014 mitigation strategy contained 48 mitigation actions. Of the County's actions, six have been completed. The majority of these actions present progress on mitigation of the high significance hazards of earthquake and wildfire. Several others action (36) are implemented annually or are currently in progress. Across all jurisdictions, 22 mitigation actions from their previous mitigation plans have been completed and 122 actions are ongoing or in progress. Overall, a total of 32 new mitigation actions were developed for all of the participating jurisdictions in the 2020 Mitigation Strategy for the County of San Luis Obispo. Table 7.1 provides a summary of the mitigation actions from the 2014 Plan that the County has completed. More details on in-progress ongoing and new actions can be found in subsection 7.3.2 and Table 7-2 below.

Table 7.1 San Luis Obispo County Mitigation Actions Completed from 2014 Plan

ID	Corresponding Hazard(s)	Mitigation Action	Lead Agency	Priority	Action Status Notes
1.A	Multi: ag pest and disease, adverse weather, biological agents, coastal storm, coastal erosion, sea level rise, dam incidents, drought, earthquake, flooding, landslides, subsidence, tsunami, wildfire, hazmat	Through newsletters, advertisements, speaking engagements and other public contacts, educate the general public and key stakeholders on the issues, responsibilities, and current efforts and successes in the area of disaster preparedness.	OES - Lead; All Support	H	OES continues to educate the public and key stakeholders on disaster preparedness through attendance of Operational Area coordination and planning meetings, speaking engagements, and attendance at public events. County OES also promotes emergency preparedness on social media and our webpage, as well as ReadySLO.org.
2.A	Multi: ag pest and disease, adverse weather, biological agents, coastal storm, coastal erosion, sea level rise, dam incidents, drought, earthquake, flooding, landslides, subsidence,	Educate the County's planning staff, administrative staff and elected officials on the importance of keeping current on trends and developments in disaster preparedness.	OES - Lead; All Support	H	OES continually offers training to County staff, organizes exercises, and actively promotes disaster preparedness.



ID	Corresponding Hazard(s)	Mitigation Action	Lead Agency	Priority	Action Status Notes
	tsunami, wildfire, hazmat				
3.A	Multi: adverse weather, wildfire, hazmat, coastal storm, coastal erosion, sea level rise, drought, earthquake, flooding, landslides, subsidence, tsunami	Continue to train all new employees and the Sheriff and CAL FIRE supervisors and officers on their roles and responsibilities at the EOC.	OES -Lead; CAL - County Fire & Sheriff's Dept	H	OES continues to train new employees regarding their roles and responsibilities at the EOC and offers EOC tours.
3.B	Adverse Weather	Develop an SOP or other procedure for guidance on external agency response coordination to winter storm type events.	OES-Lead; CAL - County Fire & Sheriff's Dept	M	Adverse Weather Events Plan was revised in 2015.
5.H	Wildfire	Adopt and enforce Wildland Urban Interface Building Code standards that emphasize ignition resistant construction.	Planning & Building Dept.	H	Title 24 of the California Code of Regulation addresses WUI requirements within the California Building Code Chapter 7A and within the California Residential Code section R337. The county adopted these codes.
6.A	Earthquake	Capture most recent earthquake fault line map.	Planning & Building Dept.	H	https://maps.conservati on.ca.gov/cgs/#datalist shows Alquist-Priolo Fault Zones data updated in January 2018.
6.C	Earthquake	Monitor the progress of PG&E as they perform studies on the newly discovered Shoreline fault and updated plans and policies as necessary.	OES	M	The seismic hazard analysis update was completed in 2015.
6.D	Earthquake	Develop seismic Retrofit of the existing Avila Beach Drive Bridge over San Luis Obispo and seek funding for implementation.	Planning & Building Dept.	M	Project completed
6.G	Earthquake; Landslides	Continue to improve GIS mapping and tracking efforts by gathering and maintaining relevant GIS data layers and imagery and utilizing the best	Planning & Building Dept.	M	County currently utilizes ESRI software. Our imagery is re-flown on average every 3 years. Also relates to 2014 action 6.A.



ID	Corresponding Hazard(s)	Mitigation Action	Lead Agency	Priority	Action Status Notes
		available mapping applications and software.			

During the 2019 update, the actions from the 2014 Plan were revisited, re-evaluated, and in some cases re-prioritized. During this process several actions were noted as being deferred. One action was deleted. The following action, “Refresh and maintain GIS mapping of residents on Evacuation Assistance List” was determined to no longer relevant to continue forward in the updated plan because of the list already being maintained by the County’s Office of Emergency Services and was decided that GIS mapping would be repetitive and not needed.

Many of the participating jurisdictions have also successfully implemented previously identified actions from their respective hazard mitigation plan. Information on each jurisdictions progress of previous mitigation actions, where applicable, and new actions developed can be found in each jurisdictional annex.

Continued Compliance with NFIP

Recognizing the importance of the NFIP in mitigating flood losses, an emphasis will be placed on continued compliance with the NFIP by San Luis Obispo County and other NFIP participating communities including the cities of Arroyo Grande, Atascadero, Paso Robles, Grover Beach, Morro Bay, Pismo Beach, and San Luis Obispo. As NFIP participants, these communities have and will continue to make every effort to remain in good standing with NFIP. This includes continuing to comply with the NFIP’s standards for updating and adopting floodplain maps and maintaining and updating the floodplain zoning ordinance. Other details related to NFIP participation are discussed in the flood vulnerability discussion in Section 5 and in the capability assessment in Section 6 and the jurisdictional annexes.

7.3.2 Updated Mitigation Action Plan

The action plan summarizes who is responsible for implementing each of the prioritized actions as well as when and how the actions will be implemented. Each action summary also includes a discussion of the benefit-cost review conducted to meet the regulatory requirements of the Disaster Mitigation Act. Table 7-2 identifies the updated mitigation actions for the County of San Luis Obispo. Actions specific to other participating jurisdictions are detailed in the jurisdictional annexes.

It is important to note that San Luis Obispo County and the participating jurisdictions have numerous existing, detailed action descriptions, which include benefit-cost estimates, in other planning documents, such as general plan elements, community wildfire protection plans and capital improvement budgets and reports. These actions are considered to be part of this plan, and the details, to avoid duplication, should be referenced in their original source document. The San Luis Obispo County planning area also realizes that new needs and priorities may arise as a result of a disaster or other circumstances and reserves the right to support new actions, as necessary, as long as they conform to the overall goals of this plan.

The results of the 2019 project identification and prioritization exercise are summarized below in Table 7-2. Included in the table are actions that are being carried forward from the 2014 plan, which are noted as continuing or deferred projects in the ‘project status’ column. Deferred projects are those that were identified in 2014 but not yet started. Continuing projects are those identified in 2014 that may have been started but either more work remains, or they are annually implemented projects. The actions are grouped



by corresponding goals of this plan. The jurisdictional annexes contain the detailed action item descriptions respective to each jurisdiction. The summary table can be used for reference during future HMPC meetings to track progress moving forward. There are actions in the table that mitigate impacts to existing as well as new buildings and infrastructure. Actions that mitigate losses to future development are denoted by an '*' in the table.



Table 7-2 San Luis Obispo County Mitigation Actions

ID	Hazard(s) Mitigated	Description/Background/Benefits	Lead Agency and Partners	Cost Estimate	Potential Funding	Priority	Timeline	Status/Implementation Notes
C.1.1	Wildfire	Work with the San Luis Obispo County Fire Safe Council to conduct fuel thinning and chipping projects in high priority areas. Collaborate with property owners and regulatory agencies in order to utilize prescribed fire on private and state-owned lands in the county.	County Fire	Less than \$10,000	HMA Grants/Staff Time/Dept. Budget	High	Ongoing	In progress; FSCSLO has obtained multiple grants exceeding \$5 million currently for fire prevention. Coupled with no less than 29 bills signed into law in 2018, and with multiple Executive Action from the Governor, there has been a significant effort to increase the pace and scale of fuel reduction. Vegetation treatment is likely to increase from several hundred acres per year to several thousand acres per year starting in 2019.
C.1.2	Multi: adverse weather, coastal storm, coastal erosion, sea level rise, dam incidents, drought, earthquake, flooding, landslides, subsidence, tsunami,	Support and implement education and public awareness programs.	OES	Little to no cost	Staff Time/Dept. Budget	Medium	Ongoing	In progress



ID	Hazard(s) Mitigated	Description/Background/Benefits	Lead Agency and Partners	Cost Estimate	Potential Funding	Priority	Timeline	Status/Implementation Notes
	wildfire, hazmat							
C.1.3	adverse weather, coastal storm, coastal erosion, sea level rise, dam incidents, drought, earthquake, flooding, landslides, subsidence, tsunami, wildfire, hazmat	Increase involvement of disadvantaged environmental justice communities in disaster preparedness activities and prioritize programs and improvements that address their needs.	Planning & Building Dept.; All Support	Little to no cost	Staff Time/Dept. Budget	High	2019-2020	Implementation through public engagement efforts for updates to the Safety Element and LHMP
C.1.4	Earthquake	Increase participation in earthquake preparedness and education activities such as the Great California Shake-Out Campaign.	OES	Little to no cost	Staff Time/Dept. Budget	High	Annual	Annual Implementation; County OES annually promotes the Great California ShakeOut by registering the County as a participant, requesting the County Board of Supervisors to adopt a resolution endorsing the County's participation in the ShakeOut, conducting a Drop, Cover and Hold On Exercise for the County

ID	Hazard(s) Mitigated	Description/Background/Benefits	Lead Agency and Partners	Cost Estimate	Potential Funding	Priority	Timeline	Status/Implementation Notes
								downtown government center, and promoting earthquake preparedness on social media, our County webpage, ReadySLO.org and via news release.
C.1.5	Tsunami	Update the San Luis Obispo County Tsunami Emergency Response Plan and maps.	OES	Little to no cost	Staff Time/Dept. Budget	Low	Ongoing	In progress; Tsunami inundation maps have been updated for the pre-plans and will be re-printed in 2020. The Tsunami Emergency Response Plan revision should be completed in 2020.
C.1.6	Tsunami	Provide training on changes to tsunami emergency plans and pre-response plans and policies to appropriate agencies.	OES	Little to no cost	Staff Time/Dept. Budget	Low	Annual	Annual Implementation
C.2.1*	Multi: Drought, flood	Continue to implement low impact development standards to reduce storm water runoff and increase groundwater recharge.	Planning & Building Dept.	Little to no cost	Staff Time/Dept. Budget	High	Annual	Annual Implementation
C.2.2*	Multi: adverse weather, biological agents, coastal storm, coastal erosion, sea level rise, drought,	Encourage planning staff to attend seminars and lectures on naturally occurring hazards so that they may better assist the appropriate governing bodies as they process future developments.	OES - Lead; All Support	Little to no cost	Staff Time/Dept. Budget	Medium	Annual	Annual Implementation; The County encourages all staff members to attend trainings, seminars and lectures ensuring up to date understanding of environmental hazards such as, sea-level rise, wildfire and climate change -



ID	Hazard(s) Mitigated	Description/Background/Benefits	Lead Agency and Partners	Cost Estimate	Potential Funding	Priority	Timeline	Status/Implementation Notes
	earthquake, flooding, landslides, subsidence, tsunami, wildfire							allowing for adequate goal and policy development.
C.2.3	Multi	Through Development Review process, require new developments to incorporate community wildfire protection planning.	Planning & Building Dept.	Little to no cost	Staff Time/Dept. Budget	High	Ongoing	In progress
C.3.1	Multi: adverse weather, coastal storm, coastal erosion, sea level rise, dam incidents, drought, earthquake, flooding, landslides, subsidence, tsunami, wildfire, hazmat	Support the development of the County Regional Community Emergency Response Team (CERT) in local areas.	OES, CAL - County Fire & Sheriff's Dept	Little to no cost	Staff Time/Dept. Budget	Medium	Annual	Annual implementation; SLO Regional CERT was officially recognized by FEMA in 2019.



ID	Hazard(s) Mitigated	Description/Background/Benefits	Lead Agency and Partners	Cost Estimate	Potential Funding	Priority	Timeline	Status/Implementation Notes
C.3.2	Multi: wildfire, earthquake, tsunami, landslides, flooding	Emergency Permit Processing/Temporary Housing to allow for mitigation considerations during the disaster recovery process.	Planning & Building Dept.	\$10,000 to \$50,000	Staff Time; Dept. Budget; potential post-disaster funding	High	5 years	NEW. This would include hiring a consultant to assist the county with emergency permit processing post disaster; develop post-disaster permitting procedures and processing; develop a simplified review and plan-check process for reviewing engineering evaluations and proposed repair plans and issuing building permits; decide if building owners will be allowed to place temporary trailers on site; educate staff of the depth of responsibility regarding hazard mitigation and develop a plan to respond for one year, or more. Benefits: Maintain momentum of the recovery period by issuing building permits to repair and reconstruct buildings in a timely fashion while ensuring resilient rebuilding.



ID	Hazard(s) Mitigated	Description/Background/Benefits	Lead Agency and Partners	Cost Estimate	Potential Funding	Priority	Timeline	Status/Implementation Notes
C.3.3	Multi: adverse weather, coastal storm, coastal erosion, sea level rise, dam incidents, drought, earthquake, flooding, landslides, subsidence, tsunami, wildfire, hazmat	Survey the applicable department and agencies as to their perceived disaster preparedness and mitigation needs. Convene special meetings to prioritize these needs and develop funding strategies.	OES-Lead; CAL - County Fire, Sheriff's Dept, and partner agencies	Little to no cost	Staff Time/Dept. Budget	Medium	Annual	In progress OES convenes regular meetings of the Disaster Planning Advisory Committee.
C.3.4	Multi: coastal storm, coastal erosion, dam incidents, drought, earthquake, flooding, landslides, tsunami, wildfire, hazmat	Encourage participation of AFN and medically fragile individuals in the County Evacuation Assistance list.	OES - Lead; All Support	Little to no cost	Staff Time/Dept. Budget	High	Annual	Annual implementation; County OES encourages participation of AFN and medically fragile individuals in the County Evacuation Assistance List. County OES continually updates the list



ID	Hazard(s) Mitigated	Description/Background/Benefits	Lead Agency and Partners	Cost Estimate	Potential Funding	Priority	Timeline	Status/Implementation Notes
C.3.5	Tsunami	Maintain emergency responder pre-response plans for tsunami inundation areas.	OES	Little to no cost	Staff Time/Dept. Budget	Medium	Ongoing	In progress; Tsunami inundation maps have been updated for the pre-plans and will be re-printed in 2019. Tsunami Emergency Response Plan was revised in April 2016 and will be revised again in 2020.
C.3.6	Tsunami	Install tsunami area warning signs.	OES – Lead; Public Works - Support	\$40,000 to \$80,000	Federal Grant and/or General Fund	Low	Ongoing	In progress; The tsunami signs have been obtained from the state. Encroachment Permit Applications for the signs have been submitted to CalTrans. The sign installation should be completed in 2020. The County will apply to be recognized as Tsunami Ready from the National Weather Service in 2021.
C.3.7	Multi: adverse weather, coastal storm, coastal erosion, sea level rise, dam incidents, drought,	Increase involvement of special needs populations (AFN, disabled, elderly) in education and disaster preparedness activities.	Public Health Dept. & OES	Little to no cost	Staff Time/Dept. Budget	Medium	Ongoing	In progress



ID	Hazard(s) Mitigated	Description/Background/Benefits	Lead Agency and Partners	Cost Estimate	Potential Funding	Priority	Timeline	Status/Implementation Notes
	earthquake, flooding, landslides, , tsunami, wildfire, hazmat							
C.3.8	Wildfire; Dam incidents; Flood; Debris Flow	Evacuation Planning. Develop enhanced evacuation plans for San Luis Obispo County. Benefits: Reduced evacuation time and potential loss of life	County Fire; County Sheriff; County OES	\$20,000 to \$75,000	General Funds; Federal Grant Funding	Medium	July 2020-June 2021	New
C.3.9*	Flood	Consider joining CRS to promote affordable flood insurance. This action would look at the cost/benefit of joining the CRS, compared to the number of flood prone properties and insurance policies. Being in the CRS includes going above and beyond the meeting minimum NFIP standards, but is not limited to public notification, community education classes, and other measures to raise awareness of flood hazards and promote flood safety. Actions would need to be documented to allow FEMA/ISO to determine the appropriate class rating. Benefits: Reduction in flood insurance rates	Public Works, Planning & Building	Less than \$10,000	Staff Time/ Dept. Budget	Medium	2 years	New



ID	Hazard(s) Mitigated	Description/Background/Benefits	Lead Agency and Partners	Cost Estimate	Potential Funding	Priority	Timeline	Status/Implementation Notes
		for the general public of the unincorporated area, greater understanding of flood hazards by residents, better property protection.						
C.3.10	Drought	Develop an umbrella water shortage contingency plan to cover rural communities pursuant to AB 1668 and SB 909 for small water suppliers with less than 15 service connections - guidance is anticipated January 2020. Identify communities vulnerable to drought and water shortages and assess reliability of supply; include drought response actions based on lessons learned in the recent droughts; provide information to property and well owners regarding vulnerability of water supplies when issuing build permits, engaging on preparedness actions, etc.; form executive level drought task force to provide regular updates to the County Website or Board of Supervisors; reference County HMP for related drought mitigation actions. *	Public Works	Less than \$10,000	Grants; Staff Time/Dept. Budget	Medium	2 years	New



ID	Hazard(s) Mitigated	Description/Background/Benefits	Lead Agency and Partners	Cost Estimate	Potential Funding	Priority	Timeline	Status/Implementation Notes
C.4.1*	Flood	Maintain compliance with the National Flood Insurance Program (NFIP) requirements.	Planning & Building Dept.	Little to no cost	Staff Time/Dept. Budget	High	Ongoing	In progress
C.4.2*	Flood	Enhance the ability of community assets, particularly critical facilities, located in the 100-year floodplain to withstand flood impacts.	Planning & Building Dept.	Little to no cost	Staff Time/Dept. Budget	High	Ongoing	In progress; Revised in 2019 from previous description; formerly 'Through Development Review process, restrict construction of essential service facilities in the 100-year flood plain.
C.4.3*	Wildfire	Prevent wildfires through aggressive code enforcement efforts by working with Engine Company Captains and Fire Prevention staff to increase the education and enforcement of PRC 4291, defensible space rules.	County Fire	Little to no cost	Staff Time/Dept. Budget	High	Ongoing	In progress; Defensible space inspections in SRA areas have increased annually exceeding 8,500 in 2018.
C.4.4*	Wildfire	In order to assist fire prevention efforts and to better manage large fires when they occur, continue to improve GIS mapping and tracking efforts by gathering and maintaining relevant GIS data layers and imagery and utilizing the best available mapping applications and software.	County Fire	Little to no cost	Staff Time/Dept. Budget	High	Ongoing	In progress; Continued to develop new map products and produce a variety of pre-attack map products to aid Incident Commanders.



ID	Hazard(s) Mitigated	Description/Background/Benefits	Lead Agency and Partners	Cost Estimate	Potential Funding	Priority	Timeline	Status/Implementation Notes
C.4.5	Wildfire	Create and maintain fuel breaks in strategic locations.	County Fire	Less than \$10,000	HMA Grants/Staff Time/Dept. Budget	High	Ongoing	In progress; Significant progress has been made and continues in several areas including Cambria, Nipomo, Parkhill, Huasna and Lake Nacimiento. New equipment has been acquired to help specifically with fuel break maintenance
C.4.6	Wildfire	Utilizing grant funding, develop a Community Wildfire Protection Plan for the County that will: Assess the fire hazard in the County; Prioritize treatment areas; Enhance collaboration among all fire agencies and stakeholders; Streamline environmental review process	County Fire	Less than \$10,000	Grant/Staff Time/Dept. Budget	High	Ongoing	In progress; FSCSLO acquired a FY 2015/16 grant from CAL FIRE for this purpose. Collaborating with all other fire jurisdictions in the County, contractor has produced a draft CWPP which is nearing completion.
C.4.7	Earthquake	Develop seismic retrofit, or replacement, of the existing South Bay Boulevard Bridge over Los Osos Creek. Seek funding for implementation.	Public Works	Little to no cost	Staff Time/Dept. Budget	Medium	Ongoing	In progress; Project funded through project design and environmental phase. Estimated construction 2022/2023.
C.4.8	Earthquake	Develop seismic retrofit of the existing Lopez Drive Bridge over Arroyo Grande Creek and seek funding for implementation.	Public Works	Little to no cost	Staff Time/Dept. Budget	Medium	Ongoing	In progress; Project funded through project design and environmental phase. Estimated construction 2022/2023.



ID	Hazard(s) Mitigated	Description/Background/Benefits	Lead Agency and Partners	Cost Estimate	Potential Funding	Priority	Timeline	Status/Implementation Notes
C.5.1	Biological Agents/Pandemic	Continue communication and coordination efforts amongst Public Health, local hospitals, healthcare workers and first responders to provide information about the effects and transmission of diseases causing epidemics along with specific preventative measures.	Public Health Dept.	Little to no cost	Staff Time/Dept. Budget	High	Annual	Annual implementation; Public Health facilitates the SLO County Disaster Healthcare Coalition to ensure regular communication and coordination among medical and health partners (including hospitals, healthcare workers and first responders) to prepare for, respond to, and recover from public health emergencies, including infectious diseases. www.slopublichealth.org/Coalition
C.5.2	Biological Agents/Pandemic	Continue general public and patient education regarding basic hygiene, cough etiquette and other disease prevention methods.	Public Health Dept.	Little to no cost	Staff Time/Dept. Budget	Medium	Annual	Annual implementation
C.5.3	Biological Agents and Ag Pests and Disease	Support establishment of a Vector Control District in San Luis Obispo County.	Agriculture, Public Health Dept.	Little to no cost	Public Health Dept.	Low	Deferred	Deferred
C.6.1	Ag Pests and Disease	Continue Agricultural Commissioner's pest detection, exclusion and eradication efforts.	County Agriculture Dept.	Little to no cost	Staff Time/Dept. Budget	Medium	Ongoing	In progress; The Department maintains an extensive program designed to either intercept (exclude) invasive pests prior to establishment



ID	Hazard(s) Mitigated	Description/Background/Benefits	Lead Agency and Partners	Cost Estimate	Potential Funding	Priority	Timeline	Status/Implementation Notes
								or detect invasive pests early enough that eradication is a feasible option. The targeted pests may vary over time due to changes in pest distribution, additional scientific information regarding destructiveness or invasiveness, or shifts in pest level prioritization.
C.6.2	Ag Pests and Disease	Continue general public education regarding existing and potential threats from various pests, the necessity for pest exclusion, and the role the public and applicable businesses have in excluding unwanted pests from the County.	County Agriculture Dept.	Little to no cost	Staff Time/Dept. Budget	Medium	Annual	Annual implementation; The Department conducts periodic outreach on various high priority insect pests and diseases, such as the Asian Citrus Psyllid, Sudden Oak Death disease, and the invasive shot-hole borer. These outreach efforts are geared toward both growers and the general public and are designed to alter behaviors that may lead to higher risks of infestation, such as the improper transport of plant material, movement of farm and harvest equipment from infested areas, and the



ID	Hazard(s) Mitigated	Description/Background/Benefits	Lead Agency and Partners	Cost Estimate	Potential Funding	Priority	Timeline	Status/Implementation Notes
								importation of firewood from infested areas.
C.6.3	Ag Pests and Disease	Implement eradication and/or control strategies appropriate to the pest species when a pest infestation is detected. Continue to improve rapid response efforts and long-term follow up.	County Agriculture Dept.	Little to no cost	Staff Time/Dept. Budget	Medium	Ongoing	In progress; If certain invasive pests are detected within the county, eradication efforts and control strategies are implemented in an effort to control the pest before it can become widely established locally. In the past few years, eradication efforts focused on Asian Citrus Psyllid have been successful as many detections have been made but due to State and County eradication efforts the pest is still not established within SLO County.
C.7.1	Adverse Weather: Extreme Heat	Establish countywide policy relating to cooling centers to be used during adverse weather events involving heat waves. Extreme heat may also result in high ozone levels which would impact sensitive receptors. Cooling centers should be designed to accommodate air	OES & Public Health	Little to no cost	Staff Time/Dept. Budget	Medium	Ongoing	In progress; OES is working with stakeholders to develop a policy and address cooling centers in the Adverse Weather Plan.



ID	Hazard(s) Mitigated	Description/Background/Benefits	Lead Agency and Partners	Cost Estimate	Potential Funding	Priority	Timeline	Status/Implementation Notes
		quality sensitive receptors if necessary.						
C.7.2	Multi: adverse weather, coastal storm, coastal erosion, sea level rise, drought, flooding, wildfire,	Support efforts to reduce greenhouse gas emissions.	Public Works	Little to no cost	Staff Time/Dept. Budget	High	Ongoing	In progress. Refer to Section 6 Capability Assessment for information on the County's climate change capabilities.
C.7.3*	Multi: adverse weather, coastal storm, coastal erosion, sea level rise, drought, flooding, wildfire	Consider potential climate change impacts when planning new facilities and critical infrastructure.	Public Works & Planning & Building Dept.	Little to no cost	Staff Time/Dept. Budget	Medium	Ongoing	In progress; Refer to Section 6 Capability Assessment for information on the County's climate change capabilities.
C.7.4	Multi: adverse weather, coastal storm, coastal erosion, sea level rise, drought,	Continue to promote energy efficiency and renewable energy within the County to reduce peak load demand.	Public Works & Planning & Building Dept.	Little to no cost	Staff Time/Dept. Budget	High	Ongoing	In progress. Refer to Section 6 Capability Assessment for information on the County's climate change capabilities.



ID	Hazard(s) Mitigated	Description/Background/Benefits	Lead Agency and Partners	Cost Estimate	Potential Funding	Priority	Timeline	Status/Implementation Notes
	flooding, wildfire							

*Mitigates losses to future development

The following table provides a summary of the individual mitigation actions by jurisdiction specific to the municipalities and special districts that participated in the 2019 plan update. Together with the County actions the tables provide an overview of all the mitigation actions proposed. More details can be found in the respective jurisdictional annexes.



Table 7-3 Jurisdictional Mitigation Actions Summary

ID	Hazard(s) Mitigated	Description/Background/Benefits	Lead Agency and Partners	Priority	Action Status
City of Arroyo Grande Mitigation Actions					
AG.1	Flood	Residential-Commercial-Government Flood smart projects Residential: relocate, revise, building codes, and provide mitigation assistance	Recreation Maintenance Services, Community Development, Emergency Preparedness	High	Annual Implementation
AG.2	Flood	Residential-Commercial-Government Flood smart projects Commercial: relocate, revise, building codes, and provide mitigation assistance	Recreation Maintenance Services, Community Development, Emergency Preparedness	High	Annual Implementation
AG.3*	Flood	Conduct a cost to benefit analysis to consider expanding the capacity of the retention basins at various locations in the City of Arroyo Grande	Recreation Maintenance Services, Community Development, Emergency Preparedness	High	Deferred; Limited availability of land to expand basins has resulted in deferral. Future analysis will focus on increasing depth of existing basins. Staff and fiscal constraints are ongoing.
AG.4*	Flood	Creation of Bio-Swales for water conservation	Recreation Maintenance Services, Community Development, Emergency Preparedness	High	Annual Implementation
AG.5	Flood	Determine cost effective mitigation strategies for Newsom Springs area	Recreation Maintenance Services, Community	High	Deferred; Limited CIP funding has been allocated to this project. In a catastrophic flood event, this area will be negatively



ID	Hazard(s) Mitigated	Description/Background/Benefits	Lead Agency and Partners	Priority	Action Status
			Development, Emergency Preparedness		impacted. Staff and fiscal constraints are ongoing.
AG.6	Flood	Conduct a cost to benefit analysis of a flood water diversion system for the City of Arroyo Grande's critical infrastructure and the flood vulnerable Commercial District	Recreation Maintenance Services, Community Development, Emergency Preparedness,	High	Deferred; Limited availability of staff and fiscal resources.
AG.7	Earthquake	Identify and catalog seismically vulnerable structures	Emergency Preparedness	High	Deferred; URM Buildings in the Village area should have been completely retrofitted. Unknown cataloging of potentially other structures throughout the city. Staff and fiscal constraints ongoing.
AG.8*	Earthquake	Notify public of location of earthquake faults	Emergency Preparedness	High	In progress; Link County of SLO OES Earthquake Plan to Fire Department & City websites.
AG.9	Earthquake	Notify public of location of Seismic vulnerable structures	Emergency Preparedness	High	In progress; Will be released upon completion of cataloging.
AG.10*	Fire	Encourage the 100' Defensible Space around structures in the Wildland Urban Interface	Fire Department, Community Development	High	In progress; Adoption of Countywide Community Wildfire Protection Plan (CWPP). Pursue grant funding to complete city-specific CWPP Limited availability of staff and fiscal resources.
AG.11	Fire	Continue weed abatement program	Fire Department, Community Development	High	Annual implementation
AG.12*	Fire	Enforce building codes and ordinances that eliminate the use of wood shake roofs	Fire Department,	High	Annual implementation



ID	Hazard(s) Mitigated	Description/Background/Benefits	Lead Agency and Partners	Priority	Action Status
			Community Development		
AG.13*	Fire	Enforce codes and ordinances that require fire sprinkler fire systems in all new structures constructed.	Fire Department, Community Development	High	Annual implementation
AG.14	Dam Failure	Create a community specific Evacuation Plan, including public outreach and education and identify public warning mechanisms and strategies.	Emergency Preparedness /Arroyo Grande Police Department	High	In progress; Existing county-wide plans with evacuation components. County Fire Chiefs have identified community-specific evacuation plans as a strategic priority.
AG.15	Dam Failure	Exercise Evacuation Plan for effectiveness, including public warning elements.	Emergency Preparedness /Arroyo Grande Police Department	High	Deferred; Will be considered upon community-specific evacuation plans.
AG.16	Dam Failure	Revise Evacuation plan as appropriate	Emergency Preparedness /Arroyo Grande Police Department	High	Deferred; Will be considered upon community-specific evacuation plans.
AG.17	Drought	Mitigate Drought Risk Through Water Availability Insurance. Continue to monitor well levels to prevent seawater intrusion while pursuing opportunities for regional recycled water projects that will result in groundwater injection.	Public Works; Community Development Department	Medium	New Benefits: Avoiding seawater intrusion; ensuring adequate water supply of the 5-cities region
City of Atascadero Mitigation Actions					
AT.1	Dam Failure	Prepare an inundation map and emergency action plan for a dam failure at Atascadero Lake. Benefits: Reduce or eliminate damages and impacts to 100+ homes and city infrastructure due to potential failure	City of Atascadero Public Works	Medium / Low	New
AT.2	Dam Failure	Minimize development along the Salinas River. Maintain setback and open space ordinances along the River and continue the enforcement of existing land use ordinances	Community Development	Medium	Annual Implementation



ID	Hazard(s) Mitigated	Description/Background/Benefits	Lead Agency and Partners	Priority	Action Status
			/ Public Works		
AT.3	Wildfire	Wildfire Evacuation Routes. Seek options to improve city road systems to become compliant with Public Resource Code 4290, designed to improve emergency access and egress and emergency evacuation times. Benefits: Improved road widths and clearance; enhanced residence evacuation times in high fire severity zones; elimination or reductions in loss of life	Atascadero Fire & Emergency Services	High	New
AT.4	Wildfire	Continue to educate public on wildland fire safety	Fire Dept.	High	In Progress
AT.5	Wildfire	Continue the enforcement on the Weed Abatement Ordinance	Fire Dept.	High	In Progress
AT.6	Wildfire	Maintain and revise the CWPP	Fire Dept.	High	In Progress
AT.7	Wildfire	Research emerging fuels management programs and implement where appropriate	Fire Dept.	High	In Progress
AT.8	Wildfire	Continue fuel load reductions program by annual control burns in the WUI impacting the city	Fire Dept.	High	In Progress
AT.9	Adverse Weather – Wind	Debris Management Plan Development. Develop a debris management plan to handle slash and leaf accumulation produced by a wind or storm event. Benefits: Reduced impacts due to debris accumulation	Public Works; Fire and Emergency Services	High	New
AT.10	Adverse Weather - Wind	Plan Around Forced Blackouts. Pacific Gas and Electric is implementing a forced power blackout during anticipated or actual wind events which may impact citizens at risk and residential care facilities; identify target hazards and at-risk populations in the event of a forced blackout. Benefits: Reduced impacts to at-risk populations from rolling blackouts	Public Works; Fire and Emergency Services	High	New
AT.11	Earthquake	Continue to enforce Uniform Building Code (UBC) provisions pertaining to grading and construction relative to seismic hazards.	Community Development / Public Works	High	In Progress



ID	Hazard(s) Mitigated	Description/Background/Benefits	Lead Agency and Partners	Priority	Action Status
AT.12	Earthquake	Continue to implement an Unreinforced Masonry (URM) building program that determines the structural safety of City owned critical facilities, and retrofit as necessary	Community Development / Public Works	High	In Progress
AT.13*	Expansive Soils	Continue to require a Soils Report for all new building permits	Community Development	Medium	In Progress. Required for all buildings over 1000 square feet
AT.14*	Flood	During the plan check process utilize GIS to ensure the building project meets current Flood Damage Prevention Regulations prior to the issuance of building permits	Community Development / Public Works	High	In Progress
AT.15	Landslide	Require construction and maintenance of natural and/or human-made retaining structures that will help control subsidence risk in key residential and/or commercial areas	Community Development / Public Works	Medium	In Progress
AT.16	Landslide	Retrofit or implement stabilizing measures for Atascadero hillside developments that predate current best practices and codes	Community Development / Public Works	Medium	In Progress
AT.17	Landslide	Located and identify unstable soils through the use of GIS and soil maps	Community Development / Public Works	Medium	In Progress
AT.18*	Landslide	Focus on proposed new developments to determine if soils stabilization is economically feasible. If the soils stabilization is not economically feasible deny, the proposed development or rezone	Community Development / Public Works	Medium	In Progress
AT.19	Drought and Water Shortage	Implement the water demand management strategies outlined in the Atascadero Mutual Water Company Urban Water Management Plan	Community Development / Public Works/ Atascadero Mutual Water Company	Medium	New



ID	Hazard(s) Mitigated	Description/Background/Benefits	Lead Agency and Partners	Priority	Action Status
City of Grover Beach Mitigation Actions					
GB.1	Adverse Weather: Wind, Rain, Heat	Reduce the negative impact on the community due to weather-related incidents that could include heavy rain, high winds and extreme heat. Benefits: Improved water runoff in low-lying areas, reduced pooling and low impact street flooding; tree trimming, and removal of old trees will reduce falling limbs and trees	Public Works Department	Low	New
GB.2	Agricultural Pest Infestation and Disease	Help reduce the negative impact on the agricultural community due to pest infestation and disease. Benefits: Through community development and planning, work with existing agricultural property owners to develop safeguards to protect against pest infestation and disease	Community Development Department	Medium	New
GB.3*	Coastal Storm, Erosion and Sea Level Rise	Work in partnership with the State of California and County of San Luis Obispo to identify community impacts associated with coastal erosion through sea level rise and storms. In coordination with the State and County, map areas of the City that may be affected by sea level rise. Benefits: Lessen the impacts on the community from the effects of sea level rise and coastal erosion	Public Works Department; Community Development; Emergency Preparedness	Medium	New
GB.4*	Dam Failure	In collaboration with state, county and other local governments, reduce the negative impact on the community as a result of a dam incident or failure through proper planning and infrastructure maintenance and improvement. City Staff will map areas of potential inundation via its Geographic Informational System and continue to implement the San Luis Obispo County Office of Emergency Services (OES) Emergency Plan. Benefits: Lessen the potential for dam failure and reduce the likelihood of this hazard occurring	Public Works Department; Community Development; Emergency Preparedness	Medium	New
GB.5*	Drought	In collaboration with state, county and other local governments, reduce the negative impact of drought on the community through proper planning and infrastructure maintenance and improvement; continue to monitor well levels to prevent seawater intrusion while pursuing opportunities for regional recycled water projects that will result in groundwater injection; implement water efficient landscaping. Benefits: Avoid sea water intrusion; lessen potential negative impacts on the community as a result of drought or water shortage	Public Works; Community Development Department	Medium	New



ID	Hazard(s) Mitigated	Description/Background/Benefits	Lead Agency and Partners	Priority	Action Status
GB.6	Earthquake	Identify and catalog seismically vulnerable structures	Emergency Preparedness	High	Deferred. Limited URM structures. Limited staff and fiscal resources
GB.7*	Earthquake	Implement policies, procedures and regulations which reduce the exposure to earthquake hazards	Emergency Preparedness	High	Annual Implementation. Building and Fire Codes
GB.8	Earthquake	Protect the improved property and infrastructure vulnerable to earthquake hazards	Emergency Preparedness	High	Annual Implementation. Building and Fire Codes
GB.9	Fire	Encourage the 100' Defensible Space around structures in the Wildland Urban Interface	Fire Department	Medium	Annual Implementation
GB.10	Fire	Continue weed abatement program	Fire Department	Medium	Annual Implementation
GB.11*	Fire	Enforce building codes and ordinances that eliminate the use of wood shake roofs	Fire Department	Medium	Annual Implementation
GB.12*	Fire	Enforce codes and ordinances that require fire sprinkler systems in all new structures constructed	Fire Department	Medium	Annual Implementation
GB.13*	Fire	Create a Fire-Smart Community by developing a comprehensive approach to reducing damage and loss due to fires; encourage the 100' defensible space around structures in the Wildland-Urban Interface (WUI); continue weed abatement program to reduce the threat of fire around open spaces; enforce building codes and ordinances that eliminate the use of wood shake roofs; enforce codes and ordinances that require fire sprinkler systems consistent with the California Building Code	Fire Department; Community Development; Emergency Preparedness	Medium	New
GB.14*	Flood	Implement policies procedures and regulations which reduce the exposure to flood hazards; protect the improved property, natural resources and life vulnerable to flood hazards; reduce the vulnerability of community assets, particularly research and identify flooding vulnerability within the city by identifying flood vulnerability within the city by identifying parcels with flood zones; identify funding needs and funding sources; apply for pre-disaster mitigation grants and commence mitigation projects; conclude mitigation projects; evaluate effectiveness of mitigation actions and critical facilities located in the 100-year floodplain	Public Works; Parks and Recreation; Community Development; Emergency Preparedness	Medium	New



ID	Hazard(s) Mitigated	Description/Background/Benefits	Lead Agency and Partners	Priority	Action Status
GB.15*	Flood	Implement policies, procedures and regulations which reduce the exposure to flood hazards	Recreation and Maintenance Services, Public Works and Emergency Preparedness	High	Annual Implementation
GB.16	Flood	Protect the improved property and infrastructure vulnerable to flood hazards	Recreation and Maintenance Services, Public Works and Emergency Preparedness	High	Annual Implementation
GB.17	Flood	Reduce the vulnerability of community assets, particularly critical facilities, located in the 100-year floodplain	Recreation and Maintenance Services, Public Works and Emergency Preparedness	High	Annual Implementation
GB.18	Hazardous Materials	Require businesses that use, store or transport hazardous materials to ensure that adequate measures are taken to protect public health and safety; coordinate with allied agencies to prepare for hazmat incidents; support training and exercises in response to hazmat incidents; coordinate responses and investigations with the county hazmat team and Five Cities Fire; add gas pipeline mapping to the City's GIS resources; continue to monitor the manufacture, storage, transport of hazardous materials by working with environmental health and public safety agencies to identify effective mitigation actions or requirements that will help reduce the risk of incidents, including the spread of released materials; coordinate with the rail line industries to prepare for train-related hazmat incidents	Fire Department; Community Development; Emergency Preparedness	Medium	New



ID	Hazard(s) Mitigated	Description/Background/Benefits	Lead Agency and Partners	Priority	Action Status
GB.19	Tsunami	Develop a comprehensive action plan to reduce damage from a tsunami; display standardized and easy to read signs alerting community members of tsunami hazard zones, evacuation routes and evacuation sites; review tsunami inundation areas and educational needs; review emergency policies and training needs; review tsunami maps and evacuation plans	Public Works; Community Development; Emergency Services	Medium	New
GB.20	Tsunami	Review Tsunami inundation areas and educational needs	Police Department	Medium	In progress. Countywide Tsunami Plan, and identification of local resource needs. Staff and fiscal constraints
GB.21	Tsunami	Review emergency policies and training needs	Police Department	Medium	Annual Implementation
GB.22	Tsunami	Review Tsunami plans, maps, and evacuation plans	Police Department	Medium	In progress. Countywide Tsunami Plan, and identification of local resource needs. County Fire Chiefs identified city-specific evacuation plans as a strategic priority. Staff and fiscal constraints
GB.23	Dam Failure	Work with our regional partners to reduce the negative impact on the community as a result of a dam incident or failure through proper planning and infrastructure maintenance and improvement.	Public Works Department, Community Development Department, Emergency Preparedness	Medium	New
GB.24	Dam Failure	Develop a public outreach program to educate residents and businesses in the dam failure inundation areas on their responsibilities and emergency preparedness.	Public Works Department, Community Development Department, Emergency Preparedness	Medium	New
GB.25	Dam Failure	Develop a dam failure emergency response plan.	Public Works Department,	Medium	New



ID	Hazard(s) Mitigated	Description/Background/Benefits	Lead Agency and Partners	Priority	Action Status
			Community Development Department, Emergency Preparedness		
GB.26	Dam Failure	Develop a hazard alert system to allow the city and regional partners to contact and alert our residents and businesses about the possibility or a dam failure and flooding caused by a dam failure.	Public Works Department, Community Development Department, Emergency Preparedness	Low-Medium	New
City of Morro Bay Mitigation Actions					
MB.1	Adverse Weather, Coastal Erosion/ Sea Level Rise, Earthquake, Flood, Landslides, Tsunami, Wildfire	Educate the planning staff, City administrative staff and elected officials on the importance of keeping up to date on trends and developments in disaster preparedness. Attendance at seminars and lectures on the specific hazards would enable staff to make appropriate recommendations to the governing bodies as they go about the process of approving new developments.	All	Medium	Annual Implementation
MB.2	Adverse Weather, Coastal Erosion/ Sea Level Rise, Earthquake, Flood, Landslides, Tsunami, Wildfire	Through newsletters, advertisements, speaking engagements and other public contacts, educate the general public and key stakeholders on the issues, responsibilities, and current efforts and successes in the area of hazard mitigation and disaster preparedness	All	Medium	Annual Implementation



ID	Hazard(s) Mitigated	Description/Background/Benefits	Lead Agency and Partners	Priority	Action Status
MB.3	Adverse Weather, Earthquake, Flood, Landslides, Tsunami, Wildfire	Train the police, harbor and fire department supervisors and officers on the activation of the County's early warning system and additional public notification systems to ensure that warning systems function as tools to mitigate potential hazard impacts to citizens.	Fire Department/ Police Department / Harbor Department	Medium	Annual Implementation
MB.4	Adverse Weather, Coastal Erosion/ Sea Level Rise, Earthquake, Flood, Landslides, Tsunami, Wildfire	Survey the applicable department heads as to their perceived hazard mitigation and disaster preparedness needs. Convene a special meeting of the Disaster Council to prioritize these needs and develop funding strategies	Fire Department	High	Annual Implementation
MB.5	Biological agents	Participate in the public education process of human and agricultural health related issues as available	Admin/FD	Medium	In progress
MB.6	Biological agents	Encourage broad participation in County public and agricultural health associated emergency preparedness exercises	Admin/FD	Medium	In progress
MB.7	Biological agents	Increase involvement of special needs populations (disabled, elderly) in education, awareness, hazard mitigation and disaster preparedness activities	Admin/FD	Medium	In progress
MB.8	Earthquake	Perform a seismic safety review of all current City structures, infrastructure and facilities paying close attention to proofing structural and non-structural mitigation of all facilities. Convene the Disaster Council to prioritize the findings of the seismic safety review and research funding strategies	PS / Fire Department	High	Annual Implementation
MB.9	Flood	Continue to work cooperatively with the state and federal flood-related agencies	All	Medium	Annual Implementation
MB.10	Tsunami	Review the current City Tsunami Plan and update it as necessary to ensure regional consistency with the SLO County Tsunami Plan	Admin / Fire Department	Medium	Annual Implementation



ID	Hazard(s) Mitigated	Description/Background/Benefits	Lead Agency and Partners	Priority	Action Status
MB.11	Tsunami	Educate the public about tsunami dangers and appropriate response and mitigation actions	Fire Department	Medium	Annual Implementation
MB.12	Tsunami	Evaluate the potential to maximize life safety associated with the use of route signs, tactical staging areas, tsunami safe zones, and traffic control points as outlined in the County Tsunami Plan	Fire Department/ PS	High	Current City Management is re-evaluating the regional plan to implement
MB.13	Wildfire, Hazardous Trees	Work with the California State Parks and San Luis Obispo County Fire Safe Council to initiate fuel thinning and chipping projects in the Black Mountain area within the City limits	Fire Department	Medium	Annual implementation. State Parks has been a great partner providing great work to improve Black Hill
MB.14	Wildfire	Continue to support the City's weed abatement program to provide additional wildfire mitigation through vegetation management.	Fire Department	Medium	New
MB.15	Flood	Amend the Municipal Code to require flood risk disclosure and active acknowledgment of expanded flood risk in property purchases/turnovers.	Community Development	Medium	New
MB.16*	Flood	Require new development in the Sea Level Rise Hazard Overlay Zone to evaluate potential impacts to adjacent or nearby properties from all proposed structural flood protection measures to ensure that these measures will not create adverse direct and/or cumulative on-site or off-site impacts.	Community Development	Medium	New
MB.17*	Flood	Continue to adopt and enforce the most up-to-date California Building Standards Code and California Fire Code, with appropriate local amendments.	Community Development; Fire	Medium	New
MB.18	Flood	Develop timing triggers for actions to address sea level rise impacts for each character area in Morro Bay based on sea level rise adaptation studies, sea level rise modeling, best available science, and the vision for each character area.	Community Development	Medium	New
MB.19*	Flood	During Development Review, determine if any structures meant for human habitation are to be constructed within the 100-year floodplain or in the Sea Level Rise Hazard Overlay Zone. If necessary, evaluate each structure's safety from flood and sea level rise related hazards, and recommend remedial actions.	Development Standards/Community Development	Medium	New
City of Paso Robles Mitigation Actions					



ID	Hazard(s) Mitigated	Description/Background/Benefits	Lead Agency and Partners	Priority	Action Status
PR.1*	Drought, Flood, Landslide, Wildfire, Subsidence	Integrate the hazard analysis and mitigation strategy into the General Plan's Safety Element.	CMO	Low	Deferred
PR.2*	Flood, Landslide, Wildfire, Subsidence	Create a GIS-based pre-application review for new construction and major remodels in hazard areas, such high wildfire severity zones, moderate landslide susceptibility areas, and dam failure inundation zones.	Community Development Department/ Department of Emergency Services	Low	Deferred
PR.3	Flood, Landslide, Wildfire	Establish a county evacuation and re-population plan. Make sure this plan works with other municipalities so that people are not receiving conflicting information about where to evacuate to. Benefit: Reduce death and injury; organized and systemic approach to evacuation of area with predesignated locations on where to go	Emergency Services Department	High	New
PR.4	Dam Failure	Develop a public outreach program that informs property owners located in the dam inundation areas about voluntary flood insurance.	Public Works Department	Low	Deferred
PR.5	Drought	Develop a drought contingency plan to provide an effective and systematic means of assessing drought conditions, develop mitigation actions and programs to reduce risks in advance of drought, and develop response options that minimize hardships during drought.	Public Works Department	High	Deferred
PR.6	Drought	Develop measures to achieve a higher level of irrigation efficiency with respect to plant water requirements, through assistance programs to customers.	Public Works Department	Low	Deferred
PR.7	Extreme Heat	Initiate an extreme heat public awareness and educational campaign to discuss the dangers of extreme heat, steps each individual can personally take during periods of extreme heat and ways to reduce energy consumption during periods of extreme heat.	Emergency Services Department	Low	Deferred
PR.8	Flood	Acquire, relocate, elevate, and/or floodproof public works critical facilities that are located within the 100-year floodplain.	Public Works Department	High	Deferred
PR.9	Flood	Reinforce roads from flooding through protection activities, including elevating the road and installing/widening culverts beneath the road or upgrading storm drains.	Public Works Department	High	Deferred



ID	Hazard(s) Mitigated	Description/Background/Benefits	Lead Agency and Partners	Priority	Action Status
PR.10	Flood	Develop a public outreach program that educates property owners about voluntary flood insurance (targeted at areas that historically flood, but are not acknowledged on FEMA flood insurance rate maps)	Public Works Department	Low	Deferred
PR.11	Flood	Partner with propane companies and regulating agencies to secure tanks located in special flood hazard areas.	Emergency Services Department	Low	Deferred
PR.12	Flood	Increase participation in the NFIP by entering the Community Rating System program which through enhanced floodplain management activities would allow property owners to receive a discount on their flood insurance.	Public Works Department	Low	Deferred
PR.13	Hazardous Materials	Continue to monitor the manufacture, storage, and transport of hazardous materials by working with environmental health and public safety agencies to identify effective mitigation actions or requirements that will help reduce the risk of incidents, including the spread of released materials.	Emergency Services Department	Low	Deferred
PR.14*	Multi: Landslide, Subsidence	Establish local zoning regulations that require the stabilization of landslide-prone areas and land subsidence hazard areas before new development can occur, through stability improvement measures such as the inclusion of interceptor drains, in-situ soil piles, drained earth buttresses, and subdrains.	Community Development Department	Low	Completed on an ongoing basis
PR.15	Wildfire	Create a new vegetation management program that provides vegetation management services to elderly, disabled, or low-income property owners who lack the resources to remove flammable vegetation from around their homes.	Emergency Services Department	High	Deferred
PR.16*	Wildfire	Implement a fuel modification program for new construction by requiring builders and developers to submit their plans, complete with proposed fuel modification zones, to the local fire department for review and approval prior to beginning construction.	Community Development Department/ Emergency Services Department	High	In progress
PR.17	Wildfire	Ability to fast track cleanup efforts in the Salinas Riverbed with approvals through Fish and Wildlife, or other agencies involved in environmentally sensitive areas	Emergency Services Department	High	New
PR.18	Earthquake	Implement Digital "Collector" App for damage inspection program (DINS)	Information Technology (GIS)	Medium	New



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PR.19	Earthquake	Implement Applied Technology Council Placards and Evaluation Forms	Community Development Department	Medium	New
PR.20	Earthquake	Develop an inventory of public and community building that may be particularly vulnerable to earthquake damage, including pre-1940's homes and with cripple wall foundations	Information Technology (GIS)	Medium	New
PR.21	Adverse Weather: Thunderstorm/ Heavy Rain/Hail/Lighting/Dense Fog/Freeze/ High Wind	Through newsletters, advertisements, speaking engagements and other public contacts, educate the general public and key stakeholders on the issues, responsibilities, and current efforts and successes in the area of hazard mitigation and disaster preparedness related to adverse weather.	Community Development Department/ Emergency Services Department	Medium	New
City of Pismo Beach Mitigation Actions					
PB.1	Flood; Coastal Storm, Sea Level Rise Dam Incidents, Tsunami	Rehabilitate Bello Bridge to withstand flooding and tsunami hazards.	Public Works	High	In progress. Working on Bello Street Bridge plans. About to start construction. Reduces impacts for flooding and emergency evacuation routes
PB.2	Flood	Work with FEMA Region IX to address any floodplain management issues that may have arisen/arise from the countywide Digital Flood Insurance Rate Map (DFIRM), Community Assessment Visits, and/or the Department of Water Resources (DWR).	Community Development, Public Works	High	In progress. Ongoing work with FEMA re FIRM maps
PB.3	Tsunami	Display standardized and easy to read signs alerting community members of tsunami hazard zones, evacuation routes, and evacuation sites.	Public Works, Police, Fire	High	In progress. Tsunami signage. Public Works has been coordinating with SLO County OES regarding consistent signage with the County. About to get signage manufactured. Not yet installed.



ID	Hazard(s) Mitigated	Description/Background/Benefits	Lead Agency and Partners	Priority	Action Status
PB.4	Dam Failure	Develop a public outreach program that informs property owners located in the dam or levee inundation areas about voluntary flood insurance.	Fire, Community Development, Public Works	High	Deferred
PB.5	Earthquake	Develop an "Earthquake Education Program" for residents which illustrates what steps the individual can take to prepare for an earthquake and mitigate the effects of an earthquake. Coordinate with Community Emergency Response Teams (CERT) where applicable.	Community Development	High	Deferred. Due to Department workload and funding.
PB.6	Earthquake	Target old pipelines in seismic areas for upgrades and automatic seismic shut-off switches that cut off natural gas to customers	Community Development, Public Works	High	In progress. Portions of gas pipelines being replaced. Switches?
PB.7	Hazardous Materials	Conduct a public awareness and educational campaign to raise awareness about the presence of hazardous materials throughout the City.	Fire, Police	High	Deferred. Still needed if there is a hazmat impact to City
PB.8	Landslide	Stabilize landslide-prone areas through stability improvement measures, including interceptor drains, in situ soil piles, drained earth buttresses, and subdrains.	Community Development, Public Works	High	Deferred. Additional study needed before requiring.
PB.9	Wildfire	Create a vegetation management program that provides vegetation management services to elderly, disabled, or low-income property owners who lack the resources to remove flammable vegetation from around their homes.	Fire	High	Deferred. Need additional Calfire approval for such a program.
PB.10	Wildfire	Implement a fuel modification program, which also includes residential maintenance requirements and enforcement, plan submittal and approval process, guidelines for planting, and a listing of undesirable plant species. Require builders and developers to submit their plans, complete with proposed fuel modification zones, to the local fire department for review and approval prior to beginning construction.	Fire	High	In progress. Vegetation reduction and weed abatement programs for fire fuel reduction have been ongoing
PB.11	Wildfire	Develop and provide funding and/or incentives for defensible space measures (e.g., free chipping day, free collection day for tree limbs).	Fire	High	Deferred. Could be useful but still needs implementation.
PB.12	Wildfire	Provide assistance to private property owners for brush and weed abatement	All cities, county, CalFire	High	New
PB.13	Wildfire	Implement a fuel modification program, which also includes residential maintenance requirements and enforcement, plan	Fire	High	In progress. Vegetation reduction and weed abatement



ID	Hazard(s) Mitigated	Description/Background/Benefits	Lead Agency and Partners	Priority	Action Status
		submittal and approval process, guidelines for planting, and a listing of undesirable plant species. Require builders and developers to submit their plans, complete with proposed fuel modification zones, to the local fire department for review and approval prior to beginning construction.			programs for fire fuel reduction have been ongoing
PB.14	Drought	Develop additional water efficient landscape measures for new construction, including the encouragement xerophytic landscape designs.	Community Development Department	Low	New
PB.15	Drought	Continue to monitor reservoir and well water levels. Develop and enact a tiered water restriction program in the event of drought conditions or other water availability emergency, including possible limits on new construction.	Community Development Department	High	New
PB.16	Coastal Erosion	Revise the City's Local Coastal Plan, which includes the General Plan and Zoning Ordinance, to identify all high hazard coastal and bluff erosion areas, identify impacts based on sea-level rise due to climate change, and identify and/or consider additional mitigations measures related to sea level rise, including, but not limited to, variable development setbacks and buffer zones, beach replenishment programs, and bluff revetment and drainage projects. The LCP Update shall include appropriate references to this Hazard Mitigation Plan.	Community Development Department	Medium	New
City of San Luis Obispo Mitigation Actions					
SL.1*	Adverse Weather, Biological, Earthquake, Flood, Wildfire, Hazardous Materials	Regularly review and continue to maintain consistency between the Safety Element, Municipal Code, zoning regulations, hazard area maps, and LHMP implementation strategies. Added 10/2016: Review the implementation and impacts of SB1069 Land use zoning	Community Development /Public Works /Fire	Medium	In progress. Safety Element to be updated in 2021
SL.2	Adverse Weather, Biological, Earthquake, Flood, Wildfire,	Train all City employees including fire fighters, police officers, building inspectors, and public works and utilities staff to levels appropriate for their hazard mitigation tasks and responsibilities.	Fire	Medium	In progress. Currently updating a City-wide training matrix to ensure employees have the valid training based on their position. Once the matrix is complete the



ID	Hazard(s) Mitigated	Description/Background/Benefits	Lead Agency and Partners	Priority	Action Status
	Hazardous Materials				City will hold training to ensure all City employees receive appropriate training and certifications. Utilize new Human Capital Management software to ensure new employees receive training during onboarding.
SL.3	Adverse Weather, Earthquake, Flood, Wildfire, Hazardous Materials	Provide training for City staff who apply its building regulations and planning standards, emphasizing the lessons learned in locations that have experienced disasters	Fire / Community Development /Public Works	Medium	In progress. Additional modeling has been completed. The results of this modeling indicated that a more expansive model should be created which is underway.
SL.4	Adverse Weather, Biological, Earthquake, Flood, Wildfire, Hazardous Materials	Conduct disaster-preparedness exercises for the types of hazards discussed in this LHMP.	Fire	Medium	In progress. Latest Public Point of Distribution drill held at the City of San Luis Obispo was on 10/18/2017. October 2018 Distribution took place on 10/21/18 in Arroyo Grande and Atascadero (the two locations exercised were intended to cover the whole county, including SLO). City plans to continue participating in exercises as allowed.
SL.5	Adverse Weather, Biological, Earthquake, Flood, Wildfire, Hazardous Materials	Establish ongoing Disaster Service Worker training program to include training for City staff to deal with emergencies as well as contribute to risk reduction measures.	Fire	Medium	In progress



ID	Hazard(s) Mitigated	Description/Background/Benefits	Lead Agency and Partners	Priority	Action Status
SL.6	Adverse Weather, Biological, Earthquake, Flood, Wildfire, Hazardous Materials	Review funding opportunities and establish centralized internal procedures to coordinate efforts for securing funds that support risk reduction measures.	Admin. - Finance	High	In progress. Spring of 2019. The City released an RFP to hire a grant writing firm to seek funding opportunities to leverage community improvement. This includes risk reduction measures.
SL.7	Adverse Weather, Biological, Earthquake, Flood, Wildfire, Hazardous Materials	Identify hazard mitigation projects eligible for grants as part of the Capital Improvement Program planning process.	Public Works/ Utilities	Medium	In progress. The Mid-Higuera Bypass project is currently being designed. Once design is complete, grant application work will begin. Utilities (new) - A \$2 million grant application has been submitted with CalOES for flood proofing mission critical facilities related the Water Resource Recovery Facility.
SL.8	Adverse Weather, Earthquake, Flood, Hazardous Materials	Assess structural capacity of key assets (including bridges) and pursue infrastructure improvements as necessary.	Public Works/ Community Development	Medium	In progress. As part of 2019-21 financial plan process the City has reviewed and prioritized assets maintenance and replacement. This prioritized asset list will be presented to the City Council for funding consideration.
SL.9	Adverse Weather, Biological, Earthquake, Flood, Wildfire, Hazardous Materials	Establish a funded program or mechanism to distribute public information regarding risk reduction activities and projects at City-sponsored events. Identify materials available for use at public education workshops. Coordinate messaging with external agencies such as the American Red Cross and Volunteer Organizations Active in Disasters.	Fire	Medium	In progress. Fire Prevention Open House occurred on and 10/14/17 and 10/13/18. Presentations at Cal Poly orientations for students and their parents. Department is developing new disaster preparedness neighborhood presentation program and



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					employee disaster worker preparedness beginning FY2020.
SL.10	Adverse Weather, Biological, Earthquake, Flood, Wildfire, Hazardous Materials	Support the efforts and education of people with access and functional needs to prepare for disasters.	Fire	Medium	In progress
SL.11	Adverse Weather, Biological, Earthquake, Flood, Wildfire, Hazardous Materials	Educate the community on individual preparedness and response to deal with emergencies at times when professional responders would be overwhelmed.	Fire	Medium	In progress. See SL.9 comments
SL.12	Adverse Weather, Biological, Earthquake, Flood, Wildfire, Hazardous Materials	Offer seminars and/or resources to assist local / small businesses in planning for continuity of operations and emergency preparedness.	Fire	Medium	In progress. Fire department staff attend the weekly meetings at the Downtown Association and has updated a fire safety checklist for festival vendors in the downtown, provided education to DTA staff.
SL.13*	Adverse Weather, Biological, Earthquake, Flood, Wildfire, Hazardous Materials	Continue to enforce local codes, ordinances, and standards pertaining to safe development and resiliency to natural and human-caused hazards.	Community Development /Fire	High	In progress. As of April of 2019, permits have been issued on all URM structures. All have been finalized/closed out except for four properties, one of which is currently being retrofitted and remodeled (SLO Brew at 736 Higuera). Permits have been issued on two others (1029 and 1035 Chorro) but have not been



ID	Hazard(s) Mitigated	Description/Background/Benefits	Lead Agency and Partners	Priority	Action Status
					finalized/closed out in permitting system. Current status on these is currently being researched. Records indicate the last of the four has completed Level A strengthening, but still has an outstanding permit - permit records and status is currently being researched.
SL.14	Earthquake	Develop and provide managers of mobile home parks with information on how to improve the seismic performance of mobile homes and awareness of flood risk.	Community Development	Medium	In progress. Still in planning process; will be incorporated into Safety Element)
SL.15	Earthquake, Wildfire, Adverse Weather	The Secure and Resilient Electricity action would plan for energy independence and security at critical facilities throughout the City. By providing grid independent onsite renewable energy, storage, and energy management systems, and by providing a planning and financing framework for future investments, the City will be able maintain uninterrupted operations during times of electricity or natural gas grid instability.	Fire; police; public works; utilities; administration; parks and recreation	High	New Benefits: A resilient electricity system (solar and storage) at critical facilities ensure ongoing operations during significant disaster events and ensures viability of electric evacuation vehicles, City fleet, and transit vehicles.
SL.16	Earthquake	Continue to implement the Unreinforced Masonry Hazard Mitigation Plan and strengthen buildings identified in Levels A and B.	Community Development / Fire	Medium	In progress. See SL.13 comments
SL.17	Flood	Develop and carry out environmentally sensitive flood reduction programs.	Administration - Natural Resources	Medium	In progress. The City continues to assess high priority erosion and sedimentation sites identified in the Waterway Management Plan and provide maintenance or restoration as appropriate; review City owned property and property with drainage easements covering private properties and conduct



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					vegetation management/removal as needed; and, complete silt removal projects at key drainage locations on a rotating basis. Assess and remove as necessary undesirable trees from creek system with tree/landscape contractors. Natural Resources Program staff manages vegetation trimming or removal to maintain the riparian corridors. The EIR for the Mid-Higuera Bypass project was adopted and the 95% plans are nearing completion.
SL.18	Haz Mat	Continue requiring businesses that use, store, or transport hazardous materials to ensure that adequate measures are taken to protect public health and safety.	Fire	High	Fire Department CUPA Participating Agency completes 100% of permitted facility inspections annually to assure compliance with the fire code and state regulations. The fire department is subject to audit by the County CUPA and has passed all recent audits.
SL.19	Haz Mat	Coordinate with allied agencies to prepare for hazardous materials incidents. Reference City EOP and Training and Exercise Plan; Maintain participation in County hazardous materials team	Fire	Medium	In progress. City Emergency Operations Plan is currently set to be updated. City issued RFP to hire consultant to update plan in Spring of 2019 and is expected to have a completed plan with associated training in Winter of 2020.
SL.20	Haz Mat	Maintain City's web site and other outlets with information regarding the safe handling and disposal of household chemicals.	Fire	Medium	In progress/ongoing



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SL.21	Wildfire	Enhance partnerships with CalFire and the local Fire Safe Council for fuel reduction efforts.	Fire	Medium	In progress. As of March of 2019, The City of San Luis Obispo is now a recognized focus group and voting board member on the Fire Safe Council
SL.22	Wildfire, Drought	Support ongoing urban forest maintenance and tree trimming programs, to include planting drought-resistant trees and plants.	Public Works - Urban Forestry / Fire / Parks & Recreation / Natural Resources	Medium	In progress. Urban Forest Services continues regular maintenance which includes pruning and dead tree removal in City Streets, Parks and other City owned properties.
SL.23	Wildfire	Continue to conduct current fuel management programs and investigate and apply new and emerging fuel management techniques.	Fire/Natural Resources Director/Parks and Recreation	High	In progress. The Natural Resource Manager has taken lead on all fuel management funds and projects in the City Open Space. Additional grant funding has been obtained to augment allocated fuel management budget.
SL.24	Wildfire	Require an enhanced fire protection plan in Local Very High Fire Severity Zones.	Fire	Medium	In progress.
SL.25	Biological	Continue offering free flu vaccines to City employees.	Human Resources	Medium	In progress. Continued participation in the County Public Health Point of Distribution program.
SL.26	Biological	Educate and encourage City employees to maintain a healthy work environment by utilizing sick and other leave benefits to avoid coming to work when sick or contagious and encouraging employees to develop plans for caring for sick family members taking care of ill family members.	Human Resources	Medium	In progress. Include in ongoing wellness, benefits, and leave of absence training, education, and general communications.
Avila Beach Community Service District Mitigation Actions					



ID	Hazard(s) Mitigated	Description/Background/Benefits	Lead Agency and Partners	Priority	Action Status
AB.1	Coastal Storm/ Coastal Erosion/ Sea Level Rise; Flood; Landslide and debris flow; Earthquake	Avila Beach Revetment Repairs to ensure Avila Beach Drive doesn't fail due to erosion and undermining or landslide.	County of SLO; Port San Luis Harbor District; Avila Beach CSD	Medium	New. Partner with Port San Luis Harbor District on solution (see Action PS.3 in the Harbor District's annex). Survey existing jetty; develop repair and augmentation plan; repair revetment. The road is also at risk of landslide. Benefits: Ensures The road is essential for access to Diablo Canyon NPP and Port San Luis.
AB.2	Coastal Storm/ Coastal Erosion/ Sea Level Rise; Flood	Avila Beach Drainage Station. Come up with a solution for drainage in Avila Beach which accumulates along Beach Colony Lane and the Avila Parking Lot; install pump station or diversion for flood waters; identify funding for long-term operations and maintenance.	County of SLO; Port San Luis Harbor District; Avila Beach CSD Avila Beach property owners	Medium	New. Partner with Port San Luis Harbor District on solution (see Action PS.3 in the Harbor District's annex). Survey existing jetty; develop repair and augmentation plan; repair revetment. Benefits: Ensures The road is essential for access to Diablo Canyon NPP and Port San Luis.
Ground Squirrel Community Service District Mitigation Actions					
GSH.1	Adverse Weather, Landslides and Debris Flow, Wildfire	Improve drainage on "Mud Corner" near 5661 Ground Squirrel Hollow Road to mitigate debris flow on road.	GSHCSD, with property owner and County	High	New A chronic problem during adverse weather due to debris flow from unstable soil on private property. GSHCSD will initiate dialog with property owner.
GSH.2	Adverse Weather	Chip Seal Overlays to extend the life and strengthen chip seal roads during extreme heat and other adverse weather. This will also help support access from emergency vehicles needed for firefighting	GSHCSD, perhaps coop purchasing with County	Medium	New GSHCSD does not generate sufficient funds.



ID	Hazard(s) Mitigated	Description/Background/Benefits	Lead Agency and Partners	Priority	Action Status
GSH.3	Adverse Weather, Landslides and Debris Flow, Wildfire	Implement road edge erosion control to mitigate undermining and failure of the road.	GSHCSD	High	New GSHCSD does some repair with available funding. Repairs are often needed after heavy weather when ruts form along the road edge. This project would reduce the need for periodic repairs.
GSH.4	Wildfire (access)	Implement "Replacement Financing" to build District funding capabilities for hazard mitigation and help ensure the District can maximize funding available for on-going maintenance of the road system.	GSHCSD	Medium	New
GSH.5	Landslides and Debris Flow, Earthquake/Liquefaction, Wildfire	Mitigate landslide risk through improvements to the Stagg Hill Road edge cribbing.	GSHCSD	Medium	New There is a short section where the road edge is supported by timber cribbing with limited life remaining. Heavy vehicles and decaying wood could exacerbate the issue.
GSH.6	Landslides and Debris Flow, Earthquake/Liquefaction, Wildfire	Build an emergency shelter with power generator and water well.	GSHCSD	High	New The District has an opportunity to purchase a parcel now for a dual purpose community shelter and meeting room; will be pursued as available funding allows.
Heritage Ranch Community Service District Mitigation Actions					
HR.1	Adverse Weather	Consider support for communication towers and other communication infrastructure to be built within the HRCSD Boundary/property to provide expanded warning capabilities related to adverse weather.	Communication companies	Low	New
HR.2	Dam Incidents; Drought;	The District currently has a vertical well project identified to mitigate low flows from the Dam during outages and/or drought, as well as to	HRCSD	High	Some preliminary engineering completed (siting, borings, conceptual drawings, etc.)



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	Flooding; Landslide /Debris Flow	provide redundancy (mitigate) for high flow releases that have historically damaged or destroyed the current gallery well system. A vertical well(s) would provide mitigation for both low and high flows (drought and Dam incidents). A vertical well(s) would improve raw water quality if debris flow occurs within Nacimiento Reservoir and River like it did after the Chimney Fire.			
HR.3	Dam Incidents; Drought; Flooding	Continue to engage with San Luis Obispo County Flood Control & Water Conservation District, and Monterey County Water Resources Agency to operate the Dam in a manner more conducive to preventing these hazards.	HRCSD; SLOCFWCD; MCWRA	Medium	New
HR.4	Earthquake	Increase risk awareness of the potential impacts of earthquakes to water and wastewater systems and conduct outreach to residents of same; Continue to partner with the Heritage Ranch Owners Association and their Emergency Services Committee on emergency planning.	HR Owners Association, HRCSD	Low	New
HR.5	Wildfire	Continue public education and awareness programs to advise residents of risk to life, health and safety; include information on defensible space and safe evacuation; Continue to partner with the Heritage Ranch Owners Association and their Emergency Services Committee on emergency planning.	HR Owners Association, HRCSD	Medium	New
Los Osos Community Service District Mitigation Actions					
LO.1	Flood	Improve drainage, public education on construction management, evacuation routes and vegetation management	LOCSD, SLO County	High	In progress. All drainage areas have been improved/upgraded. Vegetation management is in progress
LO.2	Drought, Earthquake	Engineer and install a SCADA system to improve water efficiencies and mitigate water loss if system is compromised during an earthquake.	LOCSD	High	This is a 2019/2020 scheduled project
LO.3	Wildfire	Educate the public to take precautions to prevent potentially harmful fires and be educated about surviving them. The District is encouraging local organizations to involve the residents of Los Osos and is helping coordinate town hall meetings, Community Emergency Response Team training and sending social media blasts regarding fire safety. There are many local organizations that residents can join in	Los Osos CSD / South Bay Fire Dept	High	Annual Implementation



ID	Hazard(s) Mitigated	Description/Background/Benefits	Lead Agency and Partners	Priority	Action Status
		order to be better prepared in case of a fire; Fire Safe Council, Fire Wise Cabrillo, and the Emergency Services Advisory Committee to the Los Osos Board of Directors. Benefits: With an involved community we hope to reduce risks of wildland fires to a minimum. In case of a wildfire, we hope that the community will be prepared in order to avoid human and property loss.			
Nipomo Community Service District Mitigation Actions					
N.1	Earthquake	Retrofit treatment facility buildings and process infrastructure to withstand earthquake shaking.	NCSD	Medium	Not started/Begin Assessment Process 2020
N.2*	Drought	Add secondary source of water supply as additional supply to hedge against future drought conditions.	NCSD	High	Planned to be completed by 2025
N.3	Wildfire	Install backup generators at key water production facilities to ensure water availability during power grid failures or brownouts and also to ensure that firefighting capacity remains.	NCSD	High	4 sites to be retrofitted, one per year starting Fiscal Year 2021
Oceano Community Service District Mitigation Actions					
1A – 7.2		<p>1.A - Through newsletters, speaking engagements and other public contacts, continue to educate the general public and key stakeholders on the District's issues, responsibilities, and current efforts and successes in the area of disaster preparedness.</p> <p>1.B - Utilize the District's website to inform the public of hazard mitigation efforts, disaster preparedness messages, and emergency situation information.</p> <p>2.A - Educate the Oceano Advisory Committee (OAC) members and elected OCSD BOD members on the importance of keeping current on trends and developments in disaster preparedness.</p> <p>2.B - Encourage OAC members to attend local seminars and lectures on naturally occurring hazards so that they may better understand and assist County Planning staff as they process future development.</p> <p>2.C - In order to better protect life and property, continue to accumulate from the county accurate and comprehensive series of maps and data sets that pertain to the District's earthquake, tsunami and flood threats.</p> <p>3.1A - Develop a Continuity of Operations Plan (COOP) for the District and train all essential staff on their roles and responsibilities as delineated in the Plan.</p> <p>3.1B - Update the existing Emergency Operations Plans and supporting documents to ensure coordination with the County Emergency Operations Center (EOC), Emergency Response Plans and SOP's.</p> <p>3.1C - Train all District department managers and key staff members on their roles and responsibilities in emergency management and the District DOC as outlined in independent study courses FEMA/National Incident Management System - ICS 100, 700, and 800.</p> <p>3.1D - Working with SLO County OES, increase participation by District staff members in disaster drills put on by the County.</p>			



ID	Hazard(s) Mitigated	Description/Background/Benefits	Lead Agency and Partners	Priority	Action Status
		<p>3.1E - Send one District management employee to the California Specialized Training Institute (CSTI) Public Information Officer Course.</p> <p>3.1F - Support the efforts of the FCFA in the implementation of the Five Year Strategic Plan.</p> <p>3.2A - In order to ensure that employees are available to assist during a major emergency, have all OCSD departments adopt a Family Support Plan. (Note: A model plan is available through SLO County OES.)</p> <p>3.2B - Make improvements to wastewater collection systems by replacing or relining collection pipes so as to reduce sewer overflows and limit inflow and infiltration subsequently reducing the public health threat.</p> <p>3.2C - Train staff on the proper techniques for containing sewer system overflows (SSO Protocols).</p> <p>3.3A - Work with the South County ARES/RACES group in developing a Communications Master Plan for re-establishing District's radio communications systems.</p> <p>3.3B - Utilize the South County ARES/RACES group expertise, obtain and install a base station radio, mobile radios, and a standby power source to facilitate communications throughout the District as outlined in the Communications Master Plan.</p> <p>3.4A - Develop a plan to provide standby power to the following essential service systems/functions: water well #8, the Administration Building, and the Sheriff's Substation.</p> <p>3.4B - Collaborate with the Sheriff's office on funding sources for a standby power system for the substation and the administration building.</p> <p>3.4C - Work with PG&E and County OES to explore potential funding sources for an auxiliary power source for water well # 8.</p> <p>4.1A - Support the efforts of the county in maintaining compliance with the National Flood Insurance Program (NFIP) requirements.</p> <p>4.1B - Through the Development Review process (OAC), ensure the County restricts construction of essential service facilities in the 100-year flood plain.</p> <p>4.1C - Continue to work cooperatively with the county, state, and federal flood related agencies for funding improvements through grant and agency programs.</p> <p>4.1D - Support the County's efforts to improve the drainage from the Front Street/Hwy. 1 flooding areas through a combination of vegetation management and storm drain improvements along Hwy. 1, moving the water to the Arroyo Grande Creek.</p> <p>4.1E - Relocate the District's water and sewer lines that will be impacted by the Front Street/Hwy. 1 storm drain project.</p> <p>4.1F - Support the efforts of the County and the Flood Control District in upgrading the Arroyo Grande Creek levee on both the north and south sides through a combination of vegetation and sediment management and raising both the north and south sides of the levee in a number of places.</p> <p>5.1 - Working with SLO County OES, increase the public's awareness and participation in earthquake preparedness activities such as the annual Great California Shake-Out drill.</p> <p>5.2A - Continue replacing the water lines that are most vulnerable to an earthquake as delineated in the Cannon study.</p> <p>5.2B - As delineated in the RRM Facilities Study, develop a replacement schedule for buildings found to be vulnerable to an earthquake.</p> <p>5.3A - Support the FCFA efforts to train fire department staff in the California State Fire Marshal's Rescue System 1 and 2 programs.</p> <p>5.3B - Send one District management employee to the California Specialized Training Institute (CSTI) Introduction to Earthquake Management Course.</p> <p>6.1A - Educate community members on the impacts associated with disposing of household hazardous materials on the wastewater system and provide advice on proper storage and disposal techniques.</p> <p>6.1B - Continue efforts to educate applicable employees on the handling, use, storage and disposal of hazardous materials utilized in the workplace.</p> <p>6.2 - Support the FCFA in training 2 first responders to the Hazardous Materials Technician Level (CSTI)</p>			



ID	Hazard(s) Mitigated	Description/Background/Benefits	Lead Agency and Partners	Priority	Action Status
		7.1 - Continue working with County OES in the distribution of the existing tsunami public education pamphlet/map to the visitors and residents in the Tsunami inundation zone. 7.2 - Work with County OES and the California Coastal Commission to post evacuation route signage along Pier Street, and in the Airport and Oceano Campground areas.			
San Miguel Community Service District Mitigation Actions					
SM.1	Wildfire	Improve ISO rating. As part of this project the District will sponsor a chipping program and green waste management program to support vegetation management/defensible space on properties within the district. The District will also provide public information to the Community Members on how to prepare homes creating Defensible Space, and Ready Set Go information as well.	Cal Fire	High	Annual implementation
SM.2	Wildfire	Increase fire department staffing	San Miguel Fire	Medium	Planning stage
SM.3	Flood, Earthquake	Replace the current wastewater treatment facility to current seismic design standards	San Miguel CSD, Monsoon Consultants	High	Planning stage
SM.4	Drought and Water Shortage	Provide additional or larger water storage tanks	San Miguel CSD	Medium	Planning stage
SM.5	Drought and Water Shortage	Replace aging water and wastewater underground piping	San Miguel CSD	Medium	Planning
San Simeon Community Service District Mitigation Actions					
SS.1*	Drought, Adverse Weather	Reservoir expansion project. Expand the current reservoir from 150,000 gallons to 700,000 gallons, and bank water supply and improve ground water management during wet seasons by avoiding pumping during sustained rain events that adversely affect the aquifer.	San Simeon CSD	High	New Benefits: Improved accessibility and a sustainable potable water supply for existing customers by having a larger, cleaner water supply; improved fire flow/suspension requirements;



ID	Hazard(s) Mitigated	Description/Background/Benefits	Lead Agency and Partners	Priority	Action Status
					sustainable water supply for future developments
SS.2	Wildfire	Create defensible space around the San Simeon Wastewater Treatment Plant	San Simeon CSD	Medium	New
SS.3	Flood, Coastal Storms /Coastal Flood/Sea Level Rise; Earthquake	Consider mitigation options and possible relocation of Wastewater Treatment Plan to mitigate against riverine and coastal flooding, sea level rise, and incorporate seismic design.	San Simeon CSD	Medium	New
Templeton Community Service District Mitigation Actions					
T.1	Adverse Weather(thunderstorm, lightning, high wind, extreme heat), Drought and Water Shortage, Earthquake, Flood, Wildfire	Determine backup power needs and requirements for various locations within the District determined to be critical to maintain essential District services. Install quick-connects at identified facilities. Research and purchase appropriately sized generators or portable generator(s).	Fire	High	New. Much of TCSD's critical infrastructure lacks backup power, including water wells and sewer lift stations. This could severely compromise the District's ability to deliver essential services during a power outage caused by hazards such as adverse weather, earthquake, flood, or wildfire. This becomes even more critical in the case of a drought or water shortage. The potential failure of one or more wells due to declining groundwater levels makes it all the more essential that the other wells have reliable backup power.
T.2	Drought/ Water Shortage	Initiate a Drought public awareness and educational campaign to discuss the impacts of drought and water shortage, and steps each	District Administration	Medium	New



ID	Hazard(s) Mitigated	Description/Background/Benefits	Lead Agency and Partners	Priority	Action Status
		individual can take during periods of drought and ways to reduce water consumption during periods of drought.			
T.3	Wildfire	Continue to support the District's weed abatement program to provide additional wildfire mitigation through vegetation management.	Fire	Medium	New
Cayucos Sanitary District Mitigation Actions					
CAY.1	Adverse Weather, Coastal Storm/ Erosion/Sea Level Rise, Earthquake, Flood, Landslides and Debris Flow, Tsunami, Wildfire	Conduct a Critical Facility Audit and Monitoring to determine additional hazard risk and develop appropriate mitigation as applicable.	Cayucos Sanitary District	Medium	New
CAY.2	Adverse Weather, Coastal Storm/ Erosion/Sea Level Rise, Earthquake, Flood, Landslides and Debris Flow	Implement programmed improvements to pipelines and infrastructure as indicated in the Cayucos Sanitary District Capital Improvement yearly budget with a focus to build resiliency to multiple hazards including adverse weather, earthquakes, landslides, coastal storms, and flooding.	Cayucos Sanitary District	High	New
CAY.3	Adverse Weather, Coastal Storm/	Relocation of Cayucos/Morro Bay WWTP to mitigate risk to coastal hazards, tsunami, and flood and enhance seismic resiliency in new facility.	Cayucos Sanitary District	High	New Construction is in progress in 2019. Plant is expected to be operational by end of 2020



ID	Hazard(s) Mitigated	Description/Background/Benefits	Lead Agency and Partners	Priority	Action Status
	Erosion/Sea Level Rise, Earthquake, Flood, Landslides and Debris Flow, Tsunami				
Port San Luis Obispo Harbor Mitigation Actions					
PS.1	Coastal Storm/ Coastal Erosion/ Sea Level Rise; Tsunami; Earthquake	Future Avila Pier Replacement. Develop replacement plan; remove wooden pier; replace pier with structure able to withstand sea level rise and heavy storms and waves, ideally with stronger materials like concrete and steel.	Port San Luis Harbor District	Low	New Benefits: Ensures continued existence of Avila Pier which serves the public and is a tourist attraction
PS.2	Coastal Storm/ Coastal Erosion/ Sea Level Rise; Tsunami	Revetment and Jetty Augmentation. Survey existing jetty; develop repair and augmentation plan; repair or replace revetment and jetty. Possibly replace with seawall or install seawall on top of existing jetty.	Port San Luis Harbor District	High	New Benefits: Would allow the continuation of port operations and businesses during storms and sea level rise. Would allow full use of launching facilities and parking which is vital to commercial and recreational fishing. It would help ensure the preservation of buildings and facilities It could possibly decrease the amount of dredging which would benefit the environment.
PS.3	Coastal Storm/ Coastal Erosion/ Sea Level Rise;	Avila Beach Revetment Repairs to ensure Avila Beach Drive doesn't fail due to erosion and undermining.	County of SLO; Port San Luis Harbor District; Avila Beach CSD	Medium	New Survey existing jetty; develop repair and augmentation plan; repair revetment. Benefits: Ensures The road is essential for



ID	Hazard(s) Mitigated	Description/Background/Benefits	Lead Agency and Partners	Priority	Action Status
	Flood; Landslide and debris flow; Earthquake				access to Diablo Canyon NPP and Port San Luis.
PS.4	Coastal Storm/ Coastal Erosion/ Sea Level Rise; Flood	Avila Beach Drainage Station. Come up with a solution for drainage in Avila Beach which accumulates along Beach Colony Lane and the Avila Parking Lot; install pump station or diversion for flood waters; identify funding for long-term operations and maintenance.	County of SLO; Port San Luis Harbor District; Avila Beach CSD; Avila Beach property owners	Medium	New Benefits: Flood prevention in low-lying areas in Avila Beach; reduction of health hazards caused by flooding
PS.5	Coastal Storm/ Coastal Erosion/ Sea Level Rise; Tsunami	Avila Pier Rehabilitation. Develop replacement plan; repair damaged piles and above water pier structure; open full pier to public.	Port San Luis Harbor District	Medium	New Benefits: Allow re-opening and full access to Avila Pier; currently the pier is in disrepair and is in danger of further damage during storms if repairs are not made
PS.6	Earthquake	Harbor Patrol and staff to review Harbor District's Emergency Action Plan and procedures periodically and maintain a hardcopy on-site	Port San Luis Harbor District	Medium	New
PS.7	Earthquake	Reinforce and maintain revetment below and hillside above Avila Beach Drive to prevent road failures and closures due to earthquake caused landslides	County of SLO, Port San Luis Harbor District	Medium	New
PS.8	Wildfires	Continue weed abatement and maintaining defensible space on Harbor District properties	Port San Luis Harbor District	Medium	New
PS.9	Tsunami	Harbor Patrol and staff to review County's Tsunami Response Plan and procedures periodically and maintain a hardcopy on-site	Port San Luis Harbor District	High	New



ID	Hazard(s) Mitigated	Description/Background/Benefits	Lead Agency and Partners	Priority	Action Status
PS. 10	Adverse Weather: High Winds, Hail, Frost	Use GIS to develop vulnerability assessment model of structures at risk of damage from high winds; replace roofing systems nearing end of expected lifespan with PVC roofing systems to minimize damage and prevent uplift. Reinforce and upkeep Harford Pier Canopy to prevent wind related damage and failure.	Port San Luis Harbor District	Medium	New/Ongoing. Roof replacements with heat-welded PVC flat roofs for two structures on end of Harford Pier. Inspect and reinforce Harford Pier Canopy to maintain wind resilience
PS. 11	Adverse Weather: Dense Fog	Maintain maritime visual navigation aids: 6 USCG lighted channel markers and Point San Luis Lighthouse; provide boaters, fishermen, and staff with weather forecasts. Use storm lights on Harford Pier during extreme fog.	Port San Luis Harbor District	Low	Keep channel markers maintained and replace as needed. Maintain and upgrade storm lights on Harford Pier. Seek replacement with low setting for fog.
PS. 12	Adverse Weather: Lightning	Maintain and periodically review Emergency Action Plan and Fire Plans. Maintain lightning rods on Harford Pier.	Port San Luis Harbor District	Low	Maintain lightning rods on Harford Pier.
PS. 13	Adverse Weather: Extreme Heat	Provide seasonal training to staff on the Heat Illness Prevention Plan (HIPP) and update plan as needed	Port San Luis Harbor District	Low	New. In process of preparing updated draft of District's HIPP
PS. 14	High Winds	Assess the historic canopy at the end of the Harford Pier for reinforcement and repair options.	Port San Luis Harbor District	TBD	The canopy was repaired in 2011, and is again in need of reinforcement and/or repair.
SLO FCWCD MITIGATION ACTIONS					
FCWC D.1	Flood	Review and revise the policies of the San Luis Obispo County Flood Control and Water Conservation District to help reduce the exposure to flood hazards	Flood Control and Water Conservation District	Medium	In progress
FCWC D.2	Flood	Identify flood prone areas within communities and define mitigation options under Community Drainage Studies. Engage stakeholders in defining, funding, and implementing community drainage facilities.	Flood Control and Water Conservation District	High	In progress. Drainage facility projects are identified in the community drainage studies. Implementation is in progress. The following projects identified in the studies are under



ID	Hazard(s) Mitigated	Description/Background/Benefits	Lead Agency and Partners	Priority	Action Status
					development: Hwy 1 at 13th Street drainage (Oceano), Salinas Avenue drainage (Templeton), Mallagh Street drainage (Nipomo), Mountain Springs Road sedimentation basin (Paso Robles). Revise to: Continue to develop and update the community drainage studies and prioritize and implement the recommended solutions.
FCWC D.3	Flood	Continue to update and enhance Emergency Response Plan for Arroyo Grande Creek Levee System. Develop safeguards for levee protection. Implement Arroyo Grande Waterway Management Plan to maximize floodway capacity of the facility.	Flood Control and Water Conservation District	High	In progress. The County's Dam and Levee Failure Plan, which covers the Arroyo Grande Creek Levee, was updated in February 2015 and February 2016. The Arroyo Grande Creek Levee Failure Emergency Response Plan was updated in March 2016. Revisions include: revised checklists to reflect actual response actions; divided checklists by position; updated figures and maps to reflect current conditions; updated emergency contact information; added Appendix 3: Radio Procedures and Call List; added Appendix 6: Personal Safety Plan. The District has continued to work cooperatively with the State and Federal funding agencies for implementing flood related improvements. The District has been awarded the following grants:



ID	Hazard(s) Mitigated	Description/Background/Benefits	Lead Agency and Partners	Priority	Action Status
					<p>Proposition 1E Stormwater Flood Management Grant (\$2.8M, 2013)</p> <p>Proposition 84 IRWM Implementation Grant (\$2.2M, 2013)</p> <p>FEMA Hazard Mitigation Grant (\$3.0M, 2018)</p> <p>The Oceano Drainage Improvement Project (Hwy 1 at 13th Street) is funded by various state and federal grants.</p>
FCWC D.4	Flood	Continue to work cooperatively with the state and federal flood related agencies for funding improvements through grant and agency programs	Flood Control and Water Conservation District	High	In progress
FCWC D 5.	Drought	Develop a Regional Water Infrastructure Resiliency Plan to identify key interconnections to construct and agreements to get water from where it is to where it is needed to mitigate water shortages and drought impacts	Flood Control and Water Conservation District	High	New
FCWC D 6	Dam Incidents	Perform destructive testing of the Lopez Dam to quantify previous investigation data and direct what repairs are needed. Conduct geotechnical investigation on Lopez Terminal Dam.	FCWCD, DSOD	High	The Lopez Dam and Lopez Terminal Dam are considered to be a high hazard dams by the Dept. of Safety of Dams (DSOD) due to the large population downstream. DSOD mandated that all spillways of High Hazard Dams be investigated for structural integrity and design. Preliminary studies have shown that although the Lopez Dam spillway is in fair condition it needs repairs related to spillway



ID	Hazard(s) Mitigated	Description/Background/Benefits	Lead Agency and Partners	Priority	Action Status
					under drains, crack repair, spalling concrete repair, and various other maintenance items that will insure that the spillway performs well in a spill event. The Lopez Terminal Dam seismic assessment is in process.
South San Luis Obispo County Sanitation District Mitigation Actions					
SD.1	Coastal Flood/ Coastal Erosion/ Sea Level Rise	Coastal Monitoring Program. Regularly monitoring flood and other coastal hazards at the site and management responses to those hazards both on and off site. Identifying how those hazards are impacting and affecting operations of the wastewater treatment plant. Identifying changes necessary to allow continued appropriate and required functioning of the plant. Identifying flood/hazard "triggers" to establish when actions (such as retrofits, upgrades, and including plant relocation) need to be pursued in response to specific flood/hazard events or flood management activities.	SSLOCSD	High	New. Benefits would include reduced coastal flooding impacts
SD.2	Flood; Coastal Flood/ Coastal Erosion/ Sea Level Rise; Earthquake, Dam incident	Redundancy Project - Flood Risk Mitigation Strategy. All critical new and existing facilities will be installed or upgraded to be protected from the 100-year flood event on Arroyo Grande Creek as defined by Flood Insurance Rate Map (FIRM) maps. This would also protect these facilities from floods caused by sea level rise for the design life of the facilities and provide additional protection from dam incident flooding.	SSLOCSD	High	New. Benefits include Protection of critical structures, equipment, continued operations of the wastewater treatment plant during a 100-year flood event. Redundant facilities will also be designed according to current state seismic design standards.
SD.3	Earthquake	Wastewater Treatment Plant Redundancy Project – Implementation of liquefaction hazard mitigation measures per the 2019 Redundancy Project Geotechnical Report during construction of additional treatment infrastructure.	SSLOCSD	High	New. Benefits: Ability to conceptualize the cost of relocating the plant if necessary, in the future. (\$130,000,000 in 2016 dollars to relocate); relocation would incorporate current seismic design and



ID	Hazard(s) Mitigated	Description/Background/Benefits	Lead Agency and Partners	Priority	Action Status
					provide added dam incident mitigation benefits.



SECTION 8 IMPLEMENTATION AND MONITORING

Implementation and maintenance of the plan is critical to the overall success of hazard mitigation planning. This is Planning Step 10 of the 10-step planning process. This section provides an overview of the overall strategy for plan implementation and maintenance, and outlines the method and schedule for monitoring, updating, and evaluating the plan. The section also discusses incorporating the plan into existing planning mechanisms and how to address continued public involvement.

8.1 Implementation

DMA Requirement §201.6(c)(4)(ii):

[The plan shall include a] process by which local governments incorporate the requirements of the mitigation plan into other planning mechanisms such as comprehensive or capital improvement plans, when appropriate.

Once adopted, the plan faces the truest test of its worth: implementation. While this plan contains many worthwhile actions, the participating jurisdictions will need to decide which action(s) to undertake first. Two factors will help with making that decision: the priority assigned the actions in the planning process and funding availability. Low or no-cost actions most easily demonstrate progress toward successful plan implementation.

Implementation will be accomplished by adhering to the schedules identified for each action (see Section 7 for county mitigation actions and the annexes for local mitigation actions), and through constant, pervasive, and energetic efforts to network and highlight the multi-objective, win-win benefits of each project to the San Luis Obispo County community and its stakeholders. These efforts include the routine actions of monitoring agendas, attending meetings, and promoting a safe, sustainable community.

Mitigation is most successful when it is incorporated into the day-to-day functions and priorities of government and development. Implementation will be accomplished by adhering to the schedules identified for each action and through constant, pervasive, and energetic efforts to network and highlight the multi-objective, win-win benefits to each program and the San Luis Obispo County community and its stakeholders. This effort is achieved through the routine actions of monitoring agendas, attending meetings, and promoting a safe, sustainable community. Additional mitigation strategies could include consistent and ongoing enforcement of existing policies and vigilant review of programs for coordination and multi-objective opportunities.

Simultaneously to these efforts, it is important to maintain a constant monitoring of funding opportunities that can be leveraged to implement some of the more costly recommended actions. This will include creating and maintaining a bank of ideas on how to meet local match or participation requirements, should grants be pursued. When funding becomes available, the participating jurisdiction's will be in a position to capitalize on the opportunity. Funding opportunities to be monitored include special pre- and post-disaster funds, special district budgeted funds, state and federal earmarked funds, and other grant programs, including those that can serve or support multi-objective applications.

8.1.1 Role of Hazard Mitigation Planning Committee in Implementation and Maintenance

With adoption of this plan, the participating jurisdictions will be tasked with plan implementation and maintenance. The participating jurisdictions, led by the County of San Luis Obispo Office of Emergency Services, agree to:

- Act as a forum for hazard mitigation issues;
- Disseminate hazard mitigation ideas and activities to all participants;
- Pursue the implementation of high-priority, low/no-cost recommended actions;
- Keep the concept of mitigation in the forefront of community decision making by identifying plan recommendations when other community goals, plans, and activities overlap, influence, or directly affect increased community vulnerability to disasters;
- Maintain a vigilant monitoring of multi-objective cost-share opportunities to help the community implement the plan's recommended actions for which no current funding exists;
- Monitor and assist in implementation and update of this plan;
- Report on plan progress and recommended changes to the County of San Luis Obispo Board of Supervisors and the governing boards of the other participating jurisdictions; and
- Inform and solicit input from the public.

The primary duty of the participating jurisdictions is to see the plan successfully carried out and to report to their community governing boards and the public on the status of plan implementation and mitigation opportunities. Other duties include reviewing and promoting mitigation proposals, considering stakeholder concerns about hazard mitigation, passing concerns on to appropriate entities, and posting relevant information on the county website (and others as appropriate).

8.1.2 Process for Incorporation into Existing Planning Mechanisms

Another important implementation mechanism that is highly effective and low-cost is incorporation of the hazard mitigation plan recommendations and their underlying principles into other county and city plans and mechanisms. Where possible, plan participants will use existing plans and/or programs to implement hazard mitigation actions. This plan should also be cross-referenced when related planning mechanisms are updated. As previously stated above, mitigation is most successful when it is incorporated into the day-to-day functions and priorities of government and development. As described in this plan's capability assessment and jurisdictional annexes, the county and participating jurisdictions already implement policies and programs to reduce losses to life and property from hazards. This plan builds upon the momentum developed through previous and related planning efforts and mitigation programs and recommends implementing actions, where possible, through these other program mechanisms.

These existing mechanisms include (but not limited to) the following:

- County and local general plans
- Community service district area plans and master plans
- County and local emergency operations plans
- County and local ordinances
- Flood/stormwater management/master plans
- Community wildfire protection plans
- Groundwater Sustainability Plans

- Integrated Regional Water Management Plans
- Stormwater Resource Plans
- Urban Water Management Plans Capital improvement plans and budgets
- Other plans and policies outlined in the capability assessments in the jurisdictional annexes
- Other plans, regulations, and practices with a mitigation focus

HMPC members involved in the updates to the planning mechanisms will be responsible for integrating the findings and recommendations of this plan with these other plans, programs, etc., as appropriate. As an action step to ensure integration with other planning mechanisms the County Office of Emergency Services Manager and the County Planning & Building Department or designee will discuss this topic at the annual meeting of the HMPC described below in subsection 8.2.1. The HMPC will discuss where there are opportunities to incorporate the plan into other planning mechanisms and who would be responsible for leveraging those opportunities. HMPC members representing local jurisdictions will work with their jurisdictional planning teams to integrate their identified mitigation actions into their own local plans and programs. Efforts to integrate the hazard mitigation plan into local plans, programs, and policies will be reported on at the annual HMPC plan review meeting, and a record of successful integration efforts will be kept.

Examples of a process for incorporation of the LHMP into existing planning mechanisms include:

- As recommended by Assembly Bill (AB) 2140, each community should adopt (by reference or incorporation) this LHMP into the Safety Element of their General Plan(s). Evidence of such adoption (by formal, certified resolution) shall be provided to Cal OES and FEMA.
- This 2019 update occurred in parallel with and slightly ahead of the update of the County's General Plan Safety Element. This allows for the related goals and policies to be consistent with and cross referenced in the General Plan Safety Element.
- Climate change considerations consistent with SB 379, including adaptation strategies, have been incorporated into the HMP update and cross linked with related Safety Element considerations (see summary in Appendix F).
- Integration of wildfire actions identified in this mitigation strategy with the actions and implementation priorities established in existing and recently updated Community Wildfire Protection Plan (CWPP).
- An umbrella mitigation action was developed in 2019 related to "Implement drought mitigation strategies identified in related planning documents." This action references Groundwater Sustainability Plans, Integrated Regional Water Management Plans, Stormwater Resource Plans, Urban Water Management Plans, etc. that all have actions that relate to drought mitigation.
- Using the risk assessment information to inform the hazard analysis in the San Luis Obispo County Emergency Operations Plan when that plan is updated.

Efforts should continuously be made to monitor the progress of mitigation actions implemented through these other planning mechanisms and, where appropriate, their priority actions should be incorporated into updates of this hazard mitigation plan.

8.2 Maintenance, Monitoring and Evaluation

DMA Requirement §201.6(c)(4)(i):

[The plan maintenance process shall include a] section describing the method and schedule of monitoring, evaluating, and updating the mitigation plan within a five-year cycle.

Plan maintenance implies an ongoing effort to monitor and evaluate plan implementation and to update the plan as progress, roadblocks, or changing circumstances are recognized.

8.2.1 Maintenance/Monitoring Schedule

The San Luis Obispo County Office of Emergency Services is responsible for initiating plan reviews and will consult with the heads of participating departments and other participating jurisdictions. In order to monitor progress and update the mitigation strategies identified in the action plan, the San Luis Obispo County Office of Emergency Services will revisit this plan annually and after each hazard event. The annual review will be conducted by re-convening the HMPC in November of each year. The agenda for these meetings will be coordinated through the Office of Emergency Services and the Hazard Mitigation Planning Committee. At a minimum, the meeting will include the review of the mitigation actions ranked high and medium priority.

This plan will be updated, approved and adopted within a five-year cycle as per Requirement §201.6(c)(4)(i) of the Disaster Mitigation Act of 2000 unless disaster or other circumstances (e.g., changing regulations) require a change to this schedule. With the approval of this plan occurring in late-2019, the plan will need to be updated, reviewed by Cal OES and FEMA Region IX, and re-adopted by all participating jurisdictions no later than December of 2024. The county will monitor planning grant opportunities from Cal OES and FEMA for funds to assist with the update. These grants should be pursued as early as 2022, as some grants have a three-year performance period to expend the funds, plus there is no guarantee that the grant will be awarded when initially submitted. This allows time to resubmit the grant in 2023 if needed.

8.2.2 Maintenance and Evaluation Process

The planning team will continually observe the incorporation process, evaluation method, updating method, continued public participation, and completion of the action/projects to assure that the planning team and the plan itself are performing as anticipated. By monitoring these processes, the planning team will then be able to evaluate them at the time of the plan update, determining if any changes are needed.

The LHMP plan update every five years provides an opportunity to determine whether there have been any significant changes in the county that may, in turn, necessitate changes in the types of mitigation actions proposed. New development in identified hazard areas, an increased exposure to hazards, the increase or decrease in capability to address hazards, and changes to federal or state legislation are examples of factors that may affect the necessary content of the LHMP.

The plan review provides county officials with an opportunity to evaluate those actions that have been successful and to explore the possibility of documenting potential losses that were avoided due to the implementation of specific mitigation measures. The plan review also provides the opportunity to address mitigation actions that may not have been successfully implemented as assigned.

During the five-year plan update process, the following questions will be considered as criteria for assessing the effectiveness and appropriateness of the Plan:

- Do the goals address current and expected conditions?
- Are the goals and objectives consistent with changes in State and Federal policy?
- Complete status update on all mitigation projects. What strategies should be revised?
- Has the nature or magnitude of risks changed (current and expected conditions)?
- Are the current resources appropriate for implementing the LHMP?
- Are there implementation problems, such as technical, political, legal or coordination issues with other agencies?
- Have the outcomes occurred as expected?
- Did the county and participating agencies and other partners participate in the plan implementation process as assigned?

The County of San Luis Obispo is committed to involving the public in the continual reshaping and updating of the Local Hazard Mitigation Plan, as discussed in 8.3.

8.2.3 Disaster Proclamation or Declaration

Following a disaster proclamation or declaration, the HMP will be revised as necessary to reflect lessons learned, or to address specific issues and circumstances arising from the event. It will be the responsibility of the Office of Emergency Services to reconvene the Hazard Mitigation Planning Committee and ensure the appropriate stakeholders are invited to participate in the plan revision and update process following declared disaster events.

8.3 Continued Public Involvement

DMA Requirement §201.6(c)(4)(iii):

[The plan maintenance process shall include a] discussion on how the community will continue public participation in the plan maintenance process.

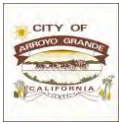
Activities related to public involvement during the 2019 update are documented in Section 3 and Appendix C.

Continued public involvement is imperative to the overall success of the plan's implementation. Efforts will be made to involve the public in the plan maintenance, evaluation, and review process. This includes maintaining a digital version of the plan on the County Office of Emergency Services website for public review. In addition, information on who to contact within the Office of Emergency Services will be posted with the plan. The San Luis Obispo County Office of Emergency Services will maintain a file of comments received for reference during the next five-year update. Any revisions to the plan that may occur as a result of a disaster will also be made public and posted on the county website.

The next five-year update process also provides an opportunity to solicit participation from new and existing stakeholders and to publicize success stories from the plan implementation and seek additional public comment. A public hearing(s) or survey to receive public comment on the plan will be held during the plan update period. When the HMPC reconvenes for the update, they will coordinate with all stakeholders participating in the planning process, including those who joined the HMPC after the initial effort, to update and revise the plan. Public notice will be posted and public participation will be invited, at a minimum, through available website postings and press releases to the local media outlets as well as email and social media announcements.

Continued public outreach and education is also an aspect of the mitigation strategy in Section 7 of this plan through inclusion of an action to develop and conduct a multi-hazard seasonal public awareness program on an annual basis (Action C.1.1).





A.1 Community Profile

A.1.1 Mitigation Planning History and 2019 Process

This annex was created during the development of the 2019 San Luis Obispo County Hazard Mitigation Plan update. This Jurisdictional Annex builds upon the previous version of the Multi-Jurisdictional Local Hazard Mitigation Plan for the Cities of Arroyo Grande, Grover Beach as well as the Lucia Mar Unified School District and South San Luis Obispo County Sanitation District; completed in December 2014 and approved by FEMA in December 2015; that previous mitigation plan was not incorporated into the City's General Plan, as this updated mitigation plan will be. The City has used the previous mitigation plan as a basis for the Emergency Operations Plan. A review of jurisdictional priorities found no significant changes in priorities since the last update.

The City's Local Planning Team (LPT), listed in Table A.1 holds responsibility for implementation and maintenance of the plan. Members are noted below. The Fire Chief for the Five Cities Fire Authority was the City's primary liaison to the County HMPC.

Table A.1 Arroyo Grande Hazard Mitigation Plan Revision Planning Group

Department or Stakeholder	Title
Five Cities Fire Authority	Fire Chief
Community Development - Engineering Division	Program Analyst
Community Development – Planning Division	Planning Manager

More details on the planning process follow and how the jurisdictions, service districts and stakeholders participated can be found in Section 3 Planning Process of the Base Plan, along with how the public was involved during the 2019 update.

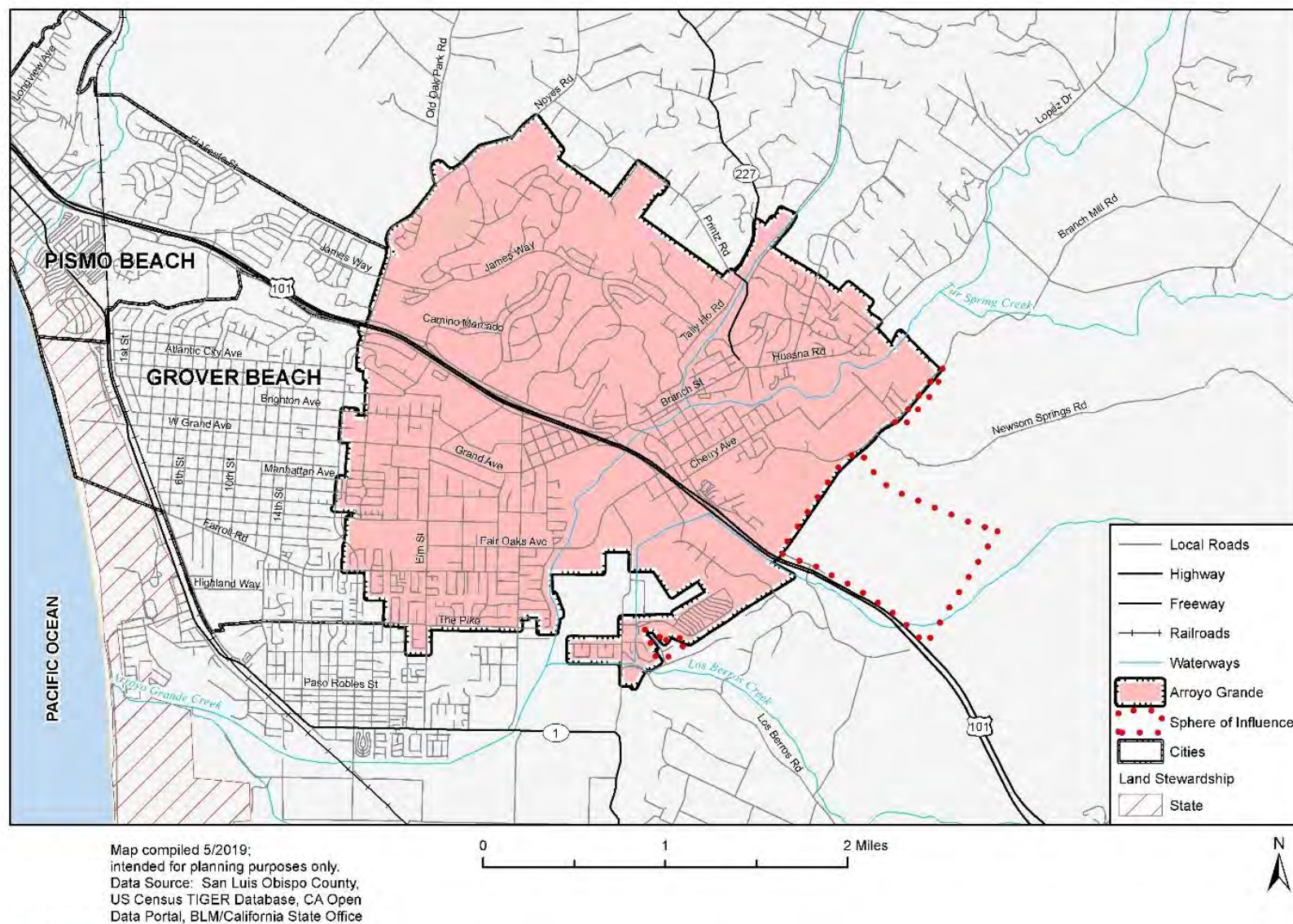
A.1.2 Geography and Climate

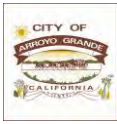
The City of Arroyo Grande is located in the south county area of San Luis Obispo County. Highway 101 traverses the City, which is located midway between the Cities of Los Angeles and San Francisco. The Cities of Pismo Beach and Grover Beach border Arroyo Grande to the northwest and west. The unincorporated community of Oceano borders on the southwest and agricultural lands border the City on the north, east and south. This area is known as the Five Cities. Arroyo Grande is the largest community in the Five Cities area, encompassing a total of 5.45 square miles. The Arroyo Grande Creek is another dominate feature that runs north-south in the eastern portion of the City and has been a source of flooding issues in the past (refer to the Vulnerability Assessment in subsection A.3). Figure A.1 displays a map the Arroyo Grande planning area.

Arroyo Grande has an average high temperature (July) of 72°F and low temperature of 42°F (January). The jurisdiction receives 16.0 inches of rain annually. While the average temperature is relatively temperate, summer and winter months bring unique weather patterns to the region. Refer to the Adverse Weather Section of the HIRA in the Base Plan (Section 5) for general details on the climate in this area.



Figure A.1 The City of Arroyo Grande





A.1.3 History

The Arroyo Grande Valley was first inhabited by the Obispena Chumash Indians. The Obispena Chumash Indians were living in the Arroyo Grande Valley when the first Spanish explorer, Juan Carbillo arrived in the Valley. In 1832, Francisco Zeba Branch purchased 17,000 acres in the Arroyo Grande Valley and started successful cattle ranching business. By 1840, colonial settlement of California led to the Arroyo Grande Valley to be divided into two major ranchos, granted by the Mexican government. In the mid 1860's a severe drought event in the Valley led to Branch's cattle population to diminish drastically. As a result, the two large ranchos were divided into smaller lots and sold to new settlers for agricultural uses. The Village of Arroyo Grande was developed to serve the new population. In 1862 the Arroyo Grande township was established by the San Luis Obispo Board of Supervisors, creating a flourishing community with a farm-based economy. In 1882 a railway depot was built, and businesses began to be established along Branch Street. Residents of the Arroyo Grande township voted on July 10, 1911 to incorporate and become the City of Arroyo Grande.

A.1.4 Economy

The top industries in the City are related to education, services and health as well as arts, entertainment and recreation, and accommodation and food services. The major employers are the Arroyo Grande Community Hospital (412 employees) and Lucia Mar Unified School District (1,000 employees) both of which are also in the top twenty-five (25) employers in the County of San Luis Obispo (San Luis Obispo Chamber of Commerce 2018). In addition to these employers, tourism is also large part of the City's economic base. According the City's 2016 Housing Element of the General Plan, 85% of residents commute out of Arroyo Grande for work.

Estimates of select economic characteristics for the City of Arroyo Grande are shown in Table A.2.

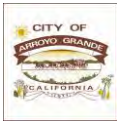
Table A.2 City of Arroyo Grande Economic Characteristics, 2013-2017

Characteristic	City of Arroyo Grande
Families below Poverty Level (%)	3.5%
All People below Poverty Level (%)	6%
Median Family Income	\$103,241
Median Household Income	\$74,654
Per Capita Income	\$38,893
Population in Labor Force	8,869
Population Employed*	8,486
Unemployment	383

Source: CA Department of Finance U.S. Census Bureau American Community Survey 2013-2017 5-Year Estimates, www.census.gov/

*Excludes armed forces

Table A.3 and Table A.4 show how the City of Arroyo Grande's labor force breaks down by occupation and industry based on estimates from the 2013-2017 five-year American Community Survey.

**Table A.3 City of Arroyo Grande's Employment by Occupation, 2013-2017**

Occupation	# Employed	% Employed
Management, Business, Science, and Arts occupations	3,591	42%
Service occupations	1,482	18%
Sales and Office occupations	1,988	23%
Natural Resources, Construction and Maintenance occupations	789	9%
Production, Transportation and Material Moving occupation	627	7%
Total	8,486	100%

Source: U.S. Census Bureau American Community Survey 2013-2017 5-Year Estimates, www.census.gov/

*Excludes armed forces

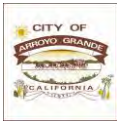
Table A.4 City of Arroyo Grande's Employment by Industry, 2013-2017

Industry	# Employed	% Employed
Educational Services, and Health Care and Social Assistance	1,897	22%
Retail Trade	823	10%
Professional, Scientific, and Mgmt., and Administrative and Waste Mgmt. Services	992	12%
Manufacturing	498	6%
Arts, Entertainment, and Recreation, and Accommodation, and Food Services	1,177	14%
Construction	571	7%
Finance and Insurance, and Real Estate and Rental and Leasing	609	7%
Public Administration	563	7%
Other Services, Except Public Administration	350	4%
Wholesale Trade	164	2%
Transportation and Warehousing, and Utilities	667	8%
Agriculture, Forestry, Fishing and Hunting, and Mining	74	1%
Information	101	1%
Total	8,486	100%

Source: U.S. Census Bureau American Community Survey 2013-2017 5-Year Estimates, www.census.gov/

A.1.5 Population

In May 2019, the State Department of Finance released preliminary population data for the state to reflect wildfire-driven changes to the local population. According to the report the City of Arroyo Grande has a population of 17,876 persons and lost 4 residents from the previous year, leaving the population statically the same. Select demographic and social characteristics for the City of Arroyo Grande from the 2013-2017 American Community Survey are shown in Table A.5.

**Table A.5 City of Arroyo Grande's Demographic and Social Characteristics, 2013-2015**

Characteristic	City of Arroyo Grande
Gender/Age	
Male	8,716
Female	9,255
Median age (years)	48
Under 5 years	930
Under 18 years	3,366
65 years and over	4,132
Race/Ethnicity	
White	15,877
Asian	1,022
Black or African American	119
American Indian/Alaska Native	52
Hispanic or Latino (of any race)	2,980
Education	
% High school graduate or higher	95%
Disability Status	
% of Population 5 years and over with a disability	11%

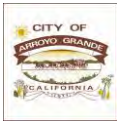
Source: CA Department of Finance, U.S. Census Bureau American Community Survey 2013-2017 5-Year Estimates, www.census.gov/

The following table with information from the American Community Survey 5-year estimates (2013-2017) is related to housing occupancy in the City of Arroyo Grande.

Table A.6 Housing Occupancy and Units

Housing Characteristic	Estimate	Percentage
Housing Occupancy		
Total Housing Units	7,847	100%
Units Occupied	7,192	92%
Vacant	655	8%
Housing Units		
1-unit detached	5,155	66%
1-unit attached	750	10%
2 units	273	4%
3 or 4 units	206	3%
5-9 units	215	3%
10-19 units	271	4%
20 or more units	442	6%
Mobile Home	519	7%
Boat, RV, van etc.	16	0.2%
Housing Tenure		
Owner Occupied	5,023	70%
Renter Occupied	2,169	30%

Source: CA Department of Finance, U.S. Census Bureau American Community Survey 2013-2017 5-Year Estimates, www.census.gov/



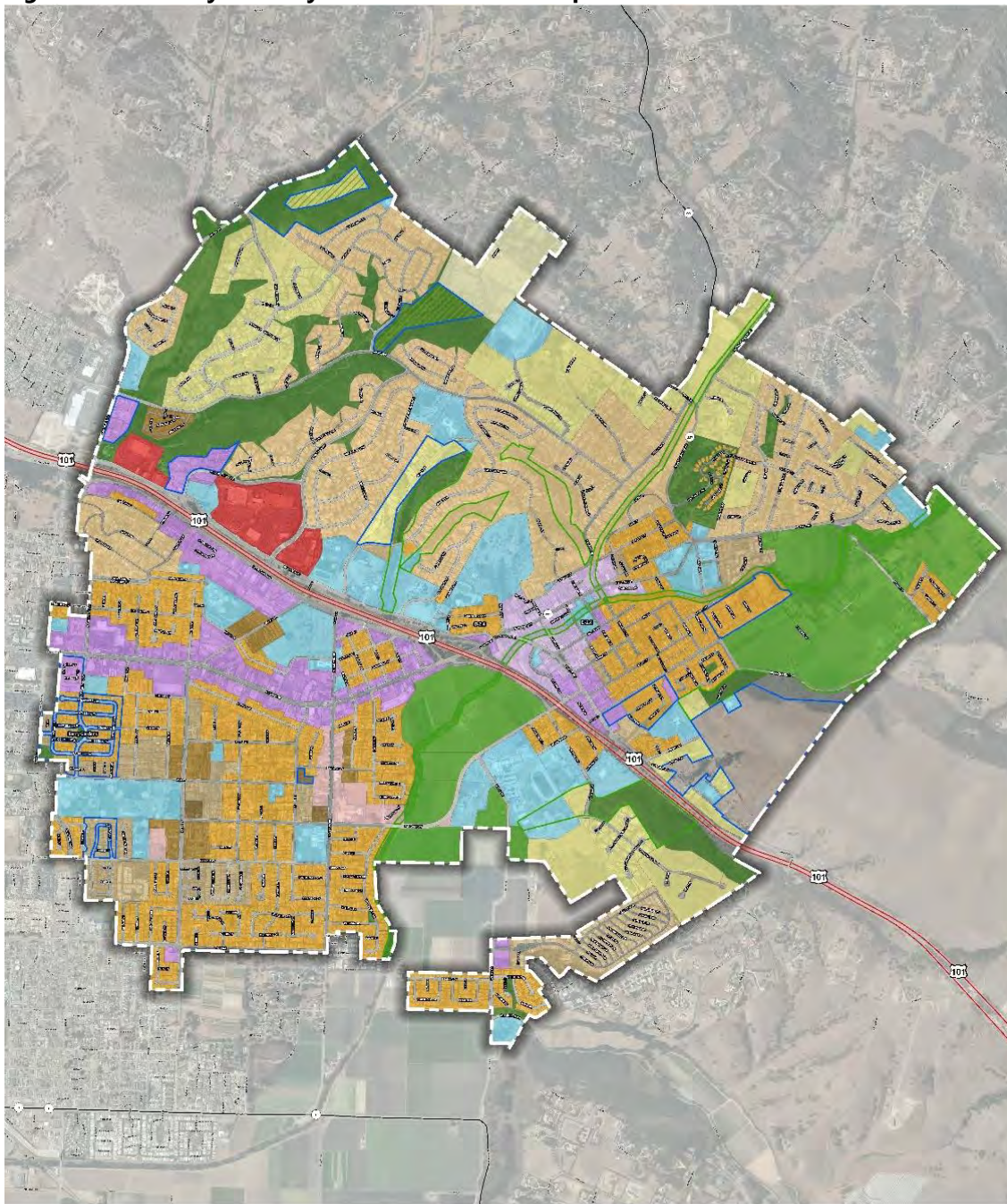
A.1.6 Development Trends

The dominant land use in the City of Arroyo Grande as shown in Figure A.2 below is residential. As can be seen in the housing table above, a majority of the residential use is single family (1-unit detached) homes that are owner occupied (70%). There are very few vacant parcels within the City's boundaries and due to the community's strong feelings toward the preservation of "prime" agricultural land, it is projected that future development will be infill and revitalization of existing parcels. According to the 2001 General Plan the infill development should be located in the following areas: East Grande Avenue, El Camino Real, and south and east of the Historic Village area. The Sphere of Influence for the City includes a 185-acre agricultural parcel along the City's southeastern boundary.















Between 2000 and 2016, the City's population grew at a similar rate to the County as a whole, adding 1,880 residents or an annual growth rate of 0.74 percent over a 16-year period. Population growth slowed down in between 2010 and 2016 with the addition of 500 residents in a 6-year period. The estimated buildout population for the City of Arroyo Grande is 20,000 by 2040. Due to water availability the City has a population growth cap of 20,000 by 2021 and is estimated to grow its population to 18,288 by 2020 (SLO County Council of Governments 2017). The availability of both the short-term and the long-term water source is the primary limitation of how the City can grow in the future. According to the City's Urban Water Management Plan (2015) the City's projected water supply should exceed its projected water demand through the year 2035.



Figure A.2 City of Arroyo Grande Land Use Map




LAND USE CATEGORIES

 Agriculture	 SFR Low-Medium Density	 Mixed-Use
 Conservation Open Space	 SFR Medium Density	 Village Core
 Community Facilities	 MFR Medium-High Density	 Office Professional
 SFR Very Low Density	 MFR High Density	 Regional Commercial
 SFR Low Density	 MFR Very High Density	

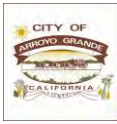
LAND USE OVERLAYS

 Conservation/Open Space
 Specific Plan
 Neighborhood Plan
 Planned Development
 Planned Development (C/OS)

 1 in = 800 ft

Last Updated September 2018

Source: City of Arroyo Grande September 2018 <https://www.arroyogrande.org/142/Planning-Division>



A.2 Hazard Identification and Summary

The City of Arroyo Grande Planning Team identified the hazards that affect the City and summarized their frequency of occurrence, spatial extent, potential magnitude, and significance specific to their community (see Table A.7). There are no hazards that are unique to Arroyo Grande. The overall hazard significance takes into account the geographic area, probability and magnitude as a way to identify priority hazards for mitigation purposes. This is discussed further in the Vulnerability Assessment Section.

Table A.7 City of Arroyo Grande – Hazard Summaries

Hazard	Geographic Area	Probability of Future Occurrence	Magnitude/Severity (Extent)	Overall Significance
Dam Incidents	Extensive	Unlikely	Catastrophic	Medium
Drought and Water Shortage	Significant	Likely	Limited	Medium
Earthquake	Significant	Highly Likely	Critical	High
Flood	Significant	Highly Likely	Limited	Medium
Wildfire	Significant	Occasional	Limited	Medium
Human Caused: Hazardous Materials	Significant	Highly Likely	Negligible	Medium
Geographic Area Limited: Less than 10% of planning area Significant: 10-50% of planning area Extensive: 50-100% of planning area Probability of Future Occurrences Highly Likely: Near 100% chance of occurrence in next year or happens every year. Likely: Between 10 and 100% chance of occurrence in next year or has a recurrence interval of 10 years or less. Occasional: Between 1 and 10% chance of occurrence in the next year or has a recurrence interval of 11 to 100 years. Unlikely: Less than 1% chance of occurrence in next 100 years or has a recurrence interval of greater than every 100 years.		Magnitude/Severity (Extent) Catastrophic—More than 50 percent of property severely damaged; shutdown of facilities for more than 30 days; and/or multiple deaths Critical—25-50 percent of property severely damaged; shutdown of facilities for at least two weeks; and/or injuries and/or illnesses result in permanent disability Limited—10-25 percent of property severely damaged; shutdown of facilities for more than a week; and/or injuries/illnesses treatable do not result in permanent disability Negligible—Less than 10 percent of property severely damaged, shutdown of facilities and services for less than 24 hours; and/or injuries/illnesses treatable with first aid Significance Low: minimal potential impact Medium: moderate potential impact High: widespread potential impact		

A.3 Vulnerability Assessment

The intent of this section is to assess Arroyo Grande's vulnerability separate from that of the planning area as a whole, which has already been assessed in subsection 5.3 Risk Assessment in the Base Plan. This vulnerability assessment analyzes the population, property, and other assets at risk to hazards ranked of medium or high significance that may vary from other parts of the planning area.



The information to support the hazard identification and risk assessment was based on a combination of the previous LHMP for the City and County and jurisdiction specific information collected during the 2019 update. A Local Hazard Mitigation Plan Update Guide and associated worksheets was distributed to each participating municipality or special district to complete during update process in 2019. Information collected was analyzed and summarized in order to identify and rank all the hazards that could impact anywhere within the County, as well as to rank the hazards and identify the related vulnerabilities unique to each jurisdiction.

Each participating jurisdiction was in support of the main hazard summary identified in the Base Plan (see Table 5.2). However, the hazard summary rankings for each jurisdictional annex may vary due to specific hazard risk and vulnerabilities unique to that jurisdiction. The information in this annex helps differentiate the jurisdiction's risk and vulnerabilities from that of the overall County.

Note: The hazard "Significance" reflects overall ranking for each hazard and is based on the City of Arroyo Grande's Planning Team member input from the Data Collection Guide and the risk assessment developed during the planning process (see Section 5 of the Base Plan), which included a more detailed qualitative and quantitative analysis with best available data.

The hazard summaries in Table A.7 above reflect the hazards that could potentially affect City. The discussion of vulnerability for each of the following hazards is located in subsection A.3.2 Estimating Potential Losses. Based on this analysis, the priority hazard (High Significance) for mitigation is earthquake. Those of Medium or High significance for the City of Arroyo Grande are identified below.

- Dam Incidents
- Drought and Water Shortage
- Earthquake
- Flood
- Hazardous Materials Incident
- Wildfire

Other Hazards

Hazards assigned a significance rating of Low and which do not differ significantly from the County ranking (e.g., Low vs. High) are not addressed further in this plan and are not assessed individually for specific vulnerabilities in this section. In the City of Arroyo Grande, those hazards include: land subsidence, agricultural pests and infestation, biological agents, adverse weather and landslides.

Additionally, the City's committee members decided to rate several hazards as Not Applicable (N/A) to the planning area due to a lack of exposure, vulnerability, and no probability of occurrence. Coastal hazards (coastal storm/coastal erosion/sea level rise and tsunami) are Not Applicable (N/A) to the City of Arroyo Grande.

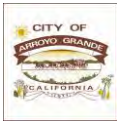
A.3.1 Assets at Risk

This section considers Arroyo Grande's assets at risk, including values at risk, critical facilities and infrastructure, historic assets, economic assets and growth and development trends.

Values at Risk

The following data on property exposure is derived from the San Luis Obispo County 2019 Parcel and Assessor data. This data should only be used as a guideline to overall values in the City as the information has some limitations. The most significant limitation is created by Proposition 13. Instead of adjusting property values annually, the values are not adjusted or assessed at fair market value until a property transfer occurs. As a result,





overall value information is likely low and does not reflect current market value of properties. It is also important to note that in the event of a disaster, it is generally the value of the infrastructure or improvements to the land that is of concern or at risk. Generally, the land itself is not a loss and is not included in the values below. Table A.8 shows the exposure of properties (e.g., the values at risk) broken down by property type for the City of Arroyo Grande.

Table A.8 2019 Property Exposure for the City of Arroyo Grande by Property Types

Property Type	Parcel Count	Improved Value	Content Value	Total Value
Agricultural	4	\$95,432	\$95,432	\$190,864
Commercial	325	\$179,293,623	\$179,293,623	\$358,587,246
Government/Utilities	80	--	--	\$0
Other/Exempt/Misc.	185	\$49,935,239	--	\$49,935,239
Residential	5,225	\$1,143,804,006	\$571,902,003	\$1,715,706,009
Multi-Family Residential	511	\$116,469,141	\$58,234,571	\$174,703,712
Mobile/Manufactured Homes	8	\$9,155,399	\$4,577,700	\$13,733,099
Residential: Other	328	\$100,039,459	\$50,019,730	\$150,059,189
Industrial	4	\$1,164,671	\$1,747,007	\$2,911,678
Vacant	23	\$8,695,079	--	\$8,695,079
Total	6,693	\$1,608,652,049	\$865,870,066	\$2,474,522,115

Source: Wood Plc analysis based on ParcelQuest and San Luis Obispo County Assessor's Office data 2019

Critical Facilities and Infrastructure

A critical facility may be defined as one that is essential in providing utility or direction either during the response to an emergency or during the recovery operation. See Section 5 of the Base Plan for more details on the definitions and categories of critical facilities.

An inventory of critical facilities in the City of Arroyo Grande from San Luis Obispo County GIS is illustrated in Figure A.3 and described in Table A.9. A more detailed list of the critical facilities, their location square footage and values from the City's 2015 HMP can be found as an attachment in to this annex.

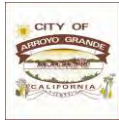
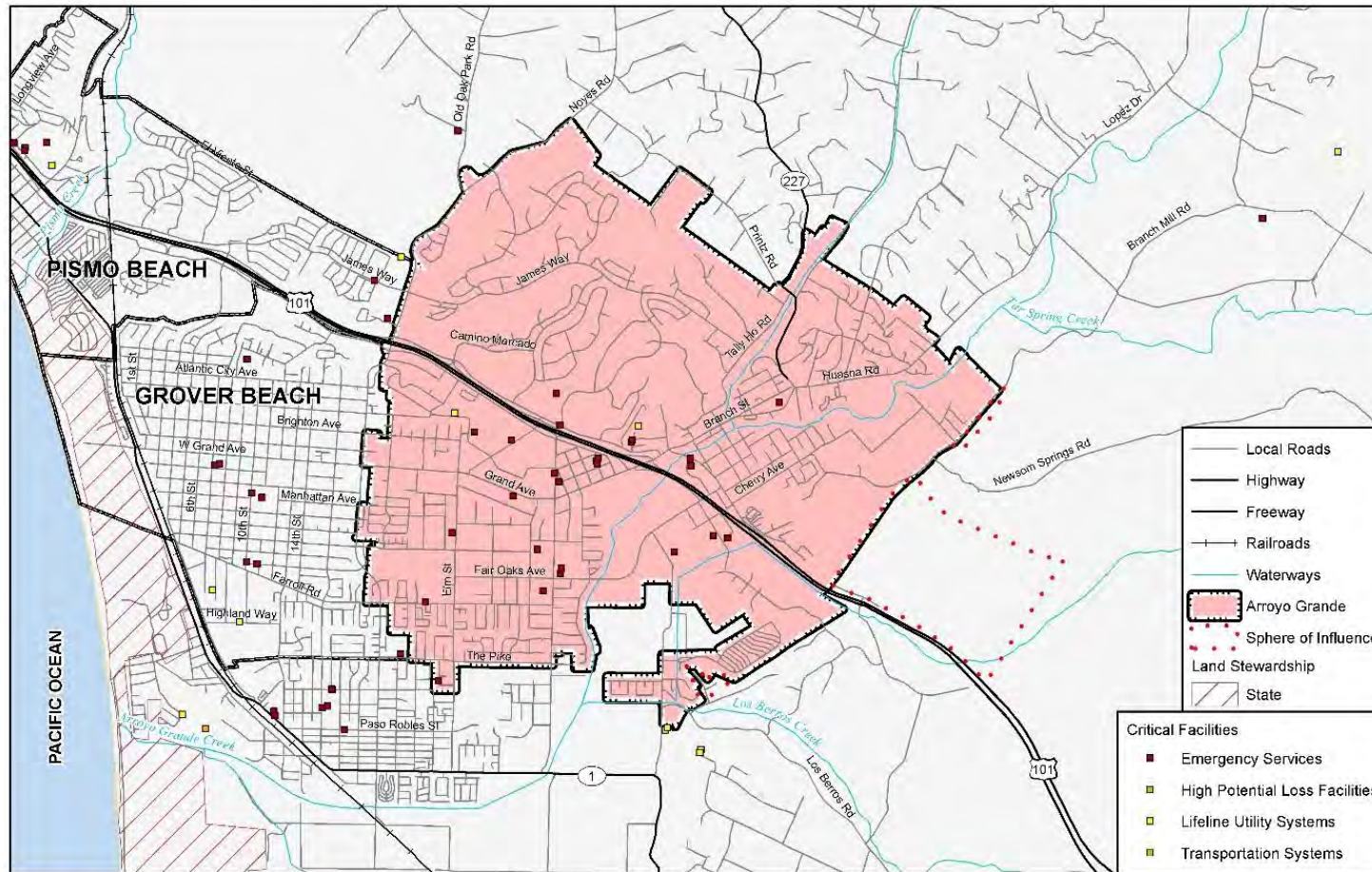


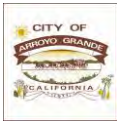
Figure A.3 City of Arroyo Grande's Critical Facilities



Map compiled 5/2019;
intended for planning purposes only.
Data Source: San Luis Obispo County,
US Census TIGER Database, CA Open
Data Portal, BLM/California State Office,
LAFCO, HIFLD

0 1 2 Miles



**Table A.9 City of Arroyo Grande's Critical Facilities**

Facility Type	Counts
Day Care Facilities	8
Emergency Medical Service Stations	2
Fire Stations	1
Hospitals	2
Local Law Enforcement	1
Nursing Homes	2
Private Schools	4
Public Schools	5
Urgent Care	1
Power Plants	1
FM Transmission Towers	1
Paging Transmission Towers	1
Energy Commission Facilities	3
Airports	1
Total	33

Source: San Luis Obispo County Planning & Building, HIFLD 2017

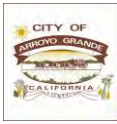
Transportation and Lifeline Facilities

Other transportation and lifelines include Highway 101 which traverses through the City of Arroyo Grande. Damages to Highway 101 would not only impact the City of Arroyo Grande but the entire region.

Historic and Cultural Resources

Heritage tourism and Arroyo Grande historical sites have been a draw to the area. There have been several informal historical surveys that have identified potential historical sites in the City, much of which is within the Village of Arroyo Grande area. According to the Historical Context Survey completed in 2011, the following are the eleven locally designated historical resources in Arroyo Grande.

- Former City Hall – 214 East Branch Street
- Conrad House – 208 East Branch Street
- Residence – 145 West Branch Street
- Office – 139 West Branch Street
- Santa Manuela School House – Heritage Square/Nelson Green
- Ruby's House – 134 South Mason Street
- Heritage House – 126 South Mason Street
- Swinging Bridge – Short Street, spanning Arroyo Grande Creek
- Bridge Street Bridge – Bridge Street, south of Olohan Alley
- Paulding House – 551 Crown Hill Street (California Register, 2009)
- Independent Order of Odd Fellows Hall (IOOF) – 128 Bridge Street (National Register, 1991)



The local tourism website (Visit Arroyo Grande) lists the following historic landmarks in addition to the ones identified above:

- The Barn Museum
- Rotary Bandstand
- Mason Street Bridge
- C. Loomis Building
- The Paulding History House
- The Pacific Coast Railroad Line
- Brisco Old Hotel – 129 E. Branch Olohan Building
- Hoosegow Park – LePoint Street.

Natural Resources

Natural resources are important to include in benefit-cost analyses for future projects and may be used to leverage additional funding for projects that also contribute to community goals for protecting sensitive natural resources. Awareness of natural assets can lead to opportunities for meeting multiple objectives. For instance, protecting wetlands areas protects sensitive habitat as well as attenuates and stores floodwaters.

The City of Arroyo Grande is part of the Arroyo Grande and Cienga Valleys which is contains “prime” soils for agricultural productions. Despite a majority of the agricultural lands are outside of the City’s jurisdiction the Arroyo Grande community understands the importance of agricultural both to the local and the countywide economy, have chosen to protect these lands, through development regulations, that border their community on the north, east, and south.

Economic Assets

Arroyo Grande has two of the largest employers in the County located in the City’s jurisdiction. The Arroyo Grande Community Hospital employees over 400 persons and is located in a dam inundation zone which would have devastating impacts not only on the local economy but also the ability for the community to respond and recovery during and after a disaster. As noted above, the Village of Arroyo Grande contains several historic structures and is a draw for tourism, a major contributor to the local economy.

A.3.2 Estimating Potential Losses

Note: This section details vulnerability to specific hazards of high or medium significance, where quantifiable, and/or where (according to LPT member input) it differs from that of the overall County.

Table A.8 above shows Arroyo Grande’s exposure to hazards in terms of number and value of structures. San Luis Obispo County’s parcel and assessor data was used to calculate the improved value of parcels. The most vulnerable structures are those in the floodplain (especially those that have been flooded in the past), unreinforced masonry buildings, and buildings built prior to the introduction of modern-day building codes. Impacts of past events and vulnerability to specific hazards are further discussed below (see subsection 5.1 Hazard Identification for more detailed information about these hazards and their impacts on San Luis Obispo County as a whole).

Note: The risk and vulnerability related to adverse weather hazards, agricultural pest infestation and disease and biological agents in Arroyo Grande do not differ from those of the County at large. Please refer to Section 5 Risk Assessment of the Base Plan for more details on these hazards.





Dam Incidents

While there have been no past dam incidents or failures in the jurisdiction of the City of Arroyo Grande, the City is among the most vulnerable communities in San Luis Obispo to the risk of dam failure. The Lopez Dam, a high hazard earthen dam located upstream from the community, poses the greatest risk to Arroyo Grande if an incident was to occur. A total of 8,273 persons and 3,565 properties could be inundated if the Lopez Dam was to fail. Failure of the Lopez Dam would follow the Arroyo Grande Creek in a westerly direction approximately 3,000 feet in each direction of the centerline of the creek channel. Refer to the Dam Inundation Estimate Losses by Jurisdiction and Dam table in Section 5 of the Base Plan for additional details on estimated losses in Arroyo Grande. A majority of properties at risk are residential as shown in the table below. There are also 13 critical facilities within the inundation zone for the Lopez Dam including Fire Station 1, Arroyo Grande Community Hospital and City Hall. Refer to the Critical Facilities in the Lopez Dam Inundation Area, by Type of Facility table in the Base Plan for details on the type of various types of critical facilities at risk. A failure of the Lopez Dam would affect Highway 101 impeding or reducing flows of goods, people and resources potentially impacting the entire region. The Lopez Dam is also a major source of water for the City of Arroyo Grande; failure of the dam would not only have immediate impacts to property but also long-term impacts on the community's water supply. Refer to the Dam Incidents Section in Section 5 of the Base Plan for additional discussion on the potential impacts of dam incidents in the County.



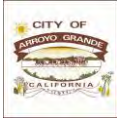
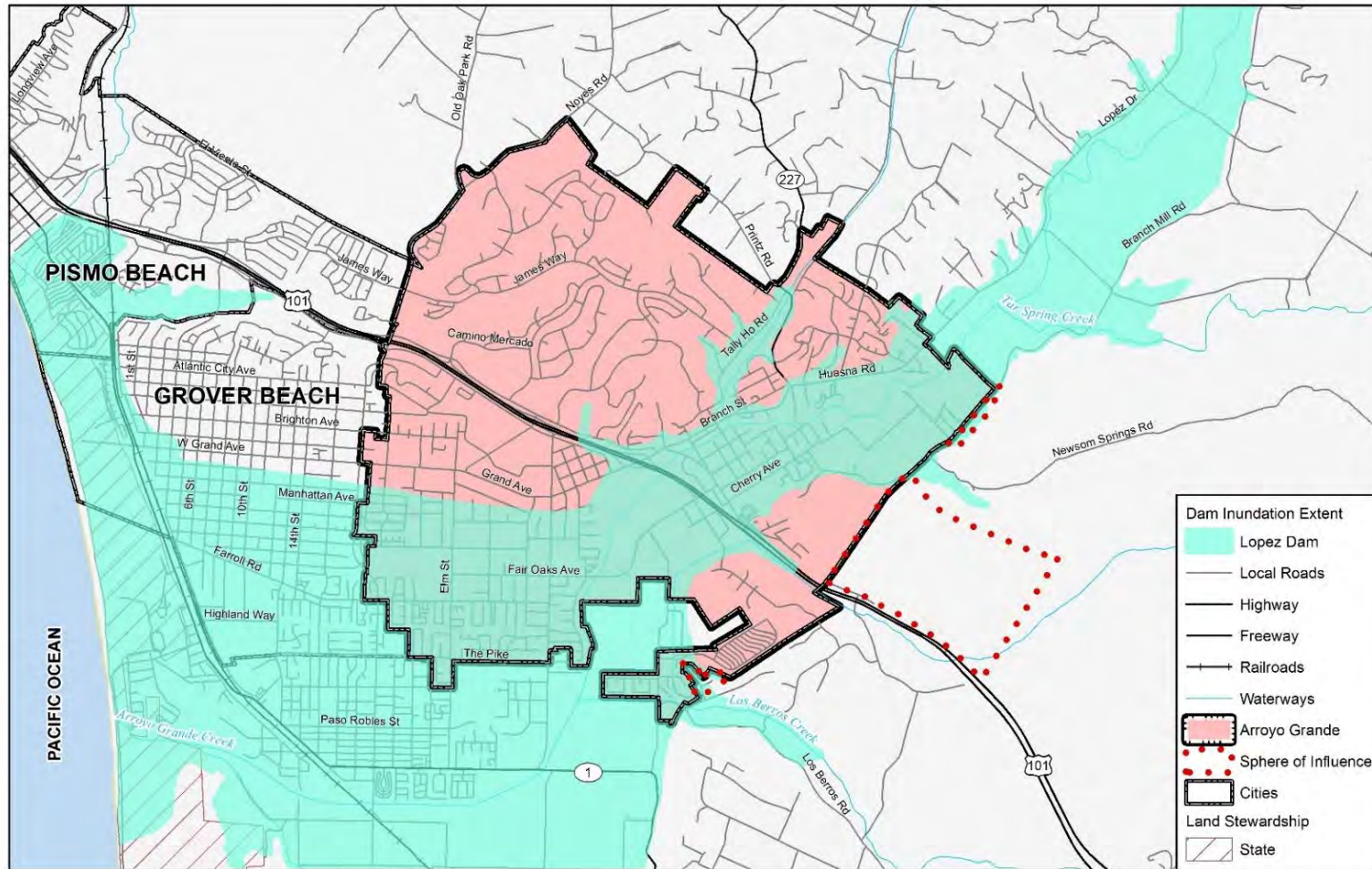
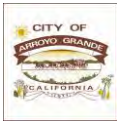


Figure A.4 Lopez Dam Inundation Zone within City of Arroyo Grande



Map compiled 5/2019;
intended for planning purposes only.
Data Source: San Luis Obispo County,
US Census TIGER Database, CA Open
Data Portal, BLM/California State Office,
LAFCO, CA DWR, NID 2018

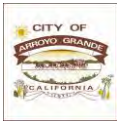
**Table A.10 Lopez Dam Inundation Estimate Losses by Property Type**

Property Type	Parcel Count	Improved Value	Content Value	Total Value	Loss Estimate	Population
Agricultural	3	\$85,571	\$85,571	\$171,142	\$85,571	--
Commercial	124	\$51,205,571	\$51,205,571	\$102,411,142	\$51,205,571	--
Government/Utilities	43	--	--	\$0	\$0	--
Other/Exempt/Misc.	90	\$17,075,208	--	\$17,075,208	\$8,537,604	--
Residential	2,899	\$494,234,816	\$247,117,408	\$741,352,224	\$370,676,112	7,276
Multi-Family Residential	191	\$63,773,355	\$31,886,678	\$95,660,033	\$47,830,016	479
Mobile/Manufactured Homes	4	\$3,696,769	\$1,848,385	\$5,545,154	\$2,772,577	10
Residential: Other	202	\$47,995,307	\$23,997,654	\$71,992,961	\$35,996,480	507
Vacant	9	\$2,985,692	--	\$2,985,692	\$1,492,846	--
TOTAL	3,565	\$681,052,289	\$356,141,266	\$1,037,193,555	\$518,596,777	8,273

Source: San Luis Obispo County Planning and Building Dept., Assessor's Office, ParcelQuest, Wood Plc Parcel Analysis

Drought and Water Shortage

The City of Arroyo Grande has a variety of water sources that support the City's water supply, including groundwater, local surface water, and storm water captured for groundwater recharge, irrigation and construction water. The following figure from the City of Arroyo Grande Urban Water Management Plan (2016) depicts the current and projected water supply through the year 2035. The City is projecting to receive an increased amount of water supply from the Lopez Reservoir and from the Santa Maria Valley and Pismo Formation groundwater basins. The City recognizes the risk of being dependent on groundwater resources, and has considered other supplies such as the State Water Project and recycled water, especially during dry years or drought conditions.

**Figure A.5 City of Arroyo Grande Current and Projected Water Supplies**

Water Supply Sources		Projected Water Supply (afy)				
Water Source	Wholesale Supplied Volume	2015	2020	2025	2030	2035
Lopez Project	Yes	2,152	2,290	2,290	2,290	2,290
Groundwater-Santa Maria Valley Groundwater Basin	No	43	1,323	1,323	1,323	1,323
Groundwater-Pismo Formation ¹	No	44	200	200	200	200
Transfers In	No	0	0	0	0	0
Exchanges In	No	0	0	0	0	0
Recycled Water	No	0	0	0	0	0
Desalinated Water	No	0	0	0	0	0
Total		2,239	3,813	3,813	3,813	3,813

¹ Assumes 80 afy of groundwater from Well No. 9, 80 afy from Well No. 10, and 40 afy from Well No. 11 will be available as a reliable source of supply from 2016 through 2030.

Source: City of Arroyo Grande Urban Water Management Plan, 2016

Severe drought events in recent years have caused concerns on the impact to the City's limited water supply. The City has taken steps to address drought in their community. On November 22, 2016 the City Council adopted Resolution 4766 which provides that if certain specified water supply conditions are determined to exist that additional restrictions for the declared Stage 1 "Water Shortage Emergency" will be implemented. A Drought Team was formed that consists of staff from various City departments to coordinate water use reduction strategies. The returned Data Collection Guide from the City of Arroyo Grande Planning Team noted that due to the region's water supply being served by a mix of reservoir and pumped well water, the state-wide drought in California has led to regional impacts; this includes watering restrictions that according to the Planning Team has led to landscaping on many properties to die, which increases the risk of wildfire for some properties.

Earthquake

Earthquake events have occurred in Arroyo Grande in the past including a number of magnitudes 5.0 to 6.2 earthquakes. There are two mapped faults within the City of Arroyo Grande, the potentially active Wilmar Avenue fault and the inactive Pismo fault; refer to the figure below. The City's downtown business district is at a greater risk from the impacts of a fault rupture compared to other part of the City due the majority of the buildings being Unreinforced Masonry. These types of buildings have shown to be unstable and have collapsed during earthquake events. The loss of buildings in the City's business district would result in loss of commerce and a significant loss in tax revenue for the City. Arroyo Grande's City Hall is one of the unreinforced masonry buildings located in the downtown business district. A magnitude 6.5 earthquake or greater could result in the loss of the building and the relocation of City Hall.

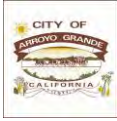
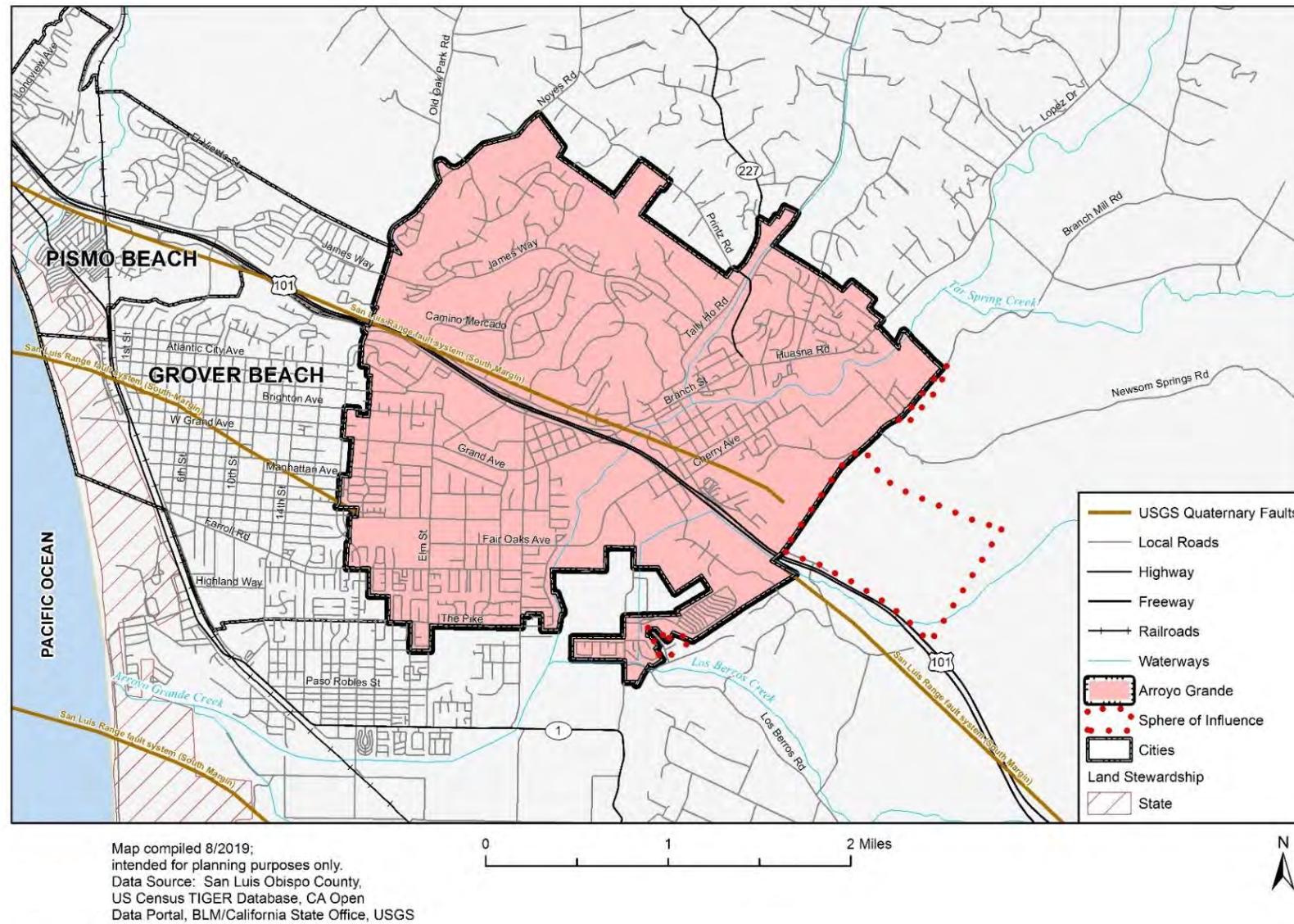
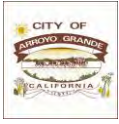


Figure A.6 City of Arroyo Grande Earthquake Faults





In addition to being at risk of groundshaking as a result of a fault rupture, the City of Arroyo Grande is also susceptible to the effects of liquefaction. Much of the City has soils with a moderate risk for liquefaction. According to GIS analysis conducted during this planning process, twenty-two (22) critical facilities located in the City are at risk of liquefaction. The map and table below describes in more detail locations and the types of properties at risk of liquefaction.



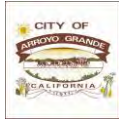
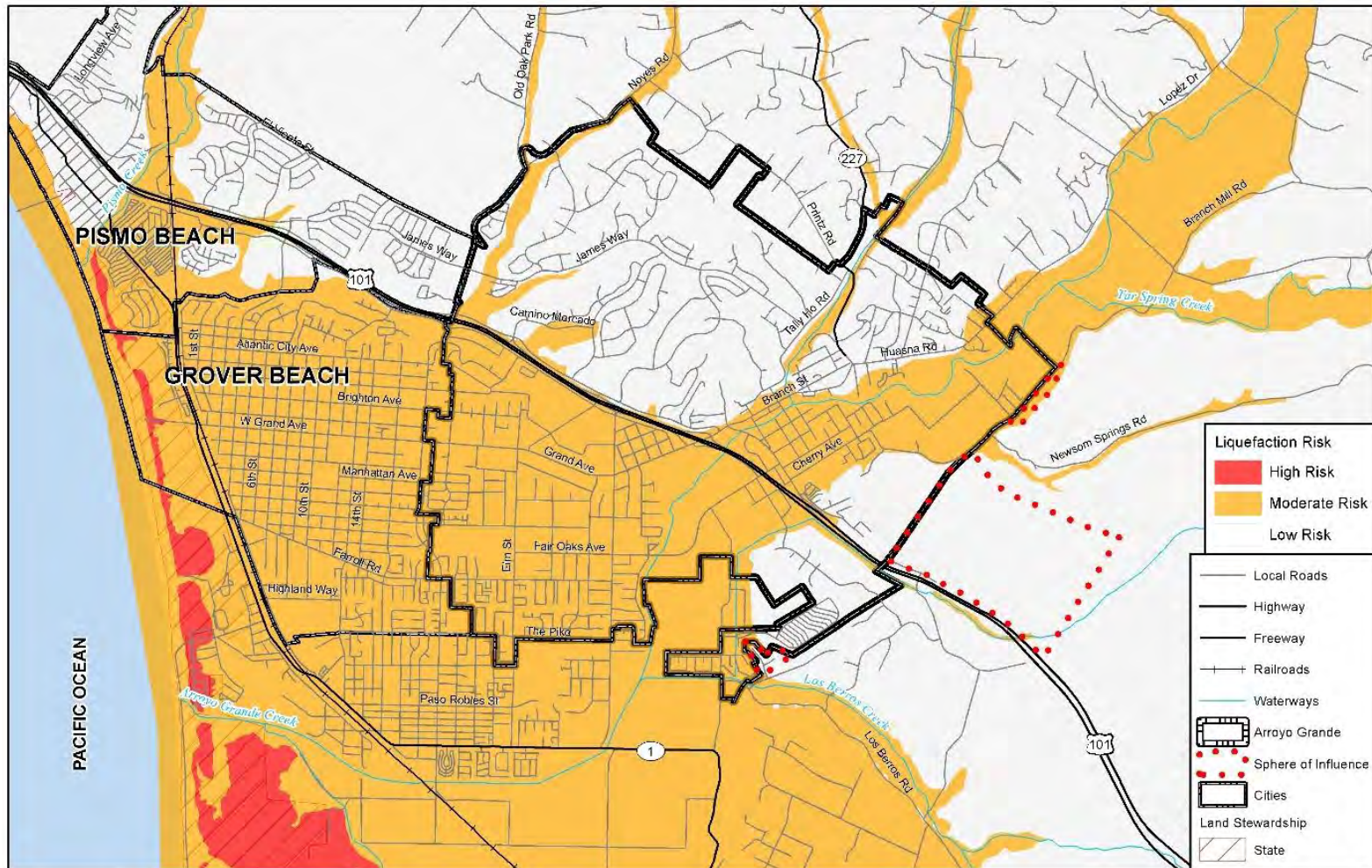


Figure A.7 Liquefaction Risk in Arroyo Grande



Map compiled 5/2019;
intended for planning purposes only.
Data Source: San Luis Obispo County,
US Census TIGER Database, CA Open
Data Portal, BLM/California State Office, LAFCO

**Table A.11 City of Arroyo Grande Moderate Liquefaction Risk by Property Type**

Property Type	Parcel Count	Improved Value
Agricultural	3	\$85,571
Commercial	277	\$145,325,794
Government/Utilities	51	--
Other/Exempt/Misc.	116	\$24,911,019
Residential	3,451	\$581,945,398
Multi-Family Residential	346	\$92,734,024
Mobile/Manufactured Homes	6	\$4,058,028
Residential: Other	230	\$61,958,301
Industrial	4	\$1,164,671
Vacant	13	\$5,796,411
TOTAL	4,497	\$917,979,217

Source: San Luis Obispo County Planning and Building Dept., Assessor's Office, ParcelQuest, Wood Plc Parcel Analysis

Flood

There are several creeks that traverse the City of Arroyo Grande: Canyon/Meadow Creek on the west, Corbett Canyon and Arroyo Grande Creeks on the east, and Los Berros Creek in the southeastern portion of City. All of the creeks have areas adjacent to the waterways that have a potential for flooding. The duration of flood events is dependent on the duration of rainfall as well as the tide levels outside of the City limits. Refer to the Flood section of the Base Plan for further information on the areas of that are at risk of flooding as well as past flood events that have impacted the City of Arroyo Grande.

In addition to being at risk of flooding from 100-year and 500-year storms, according FEMA's FIS for the County (2012), Arroyo Grande is subject to sheet flow, shallow (generally less than 3 feet deep) overland flooding characterized by unpredictable flow paths or confined to streets.

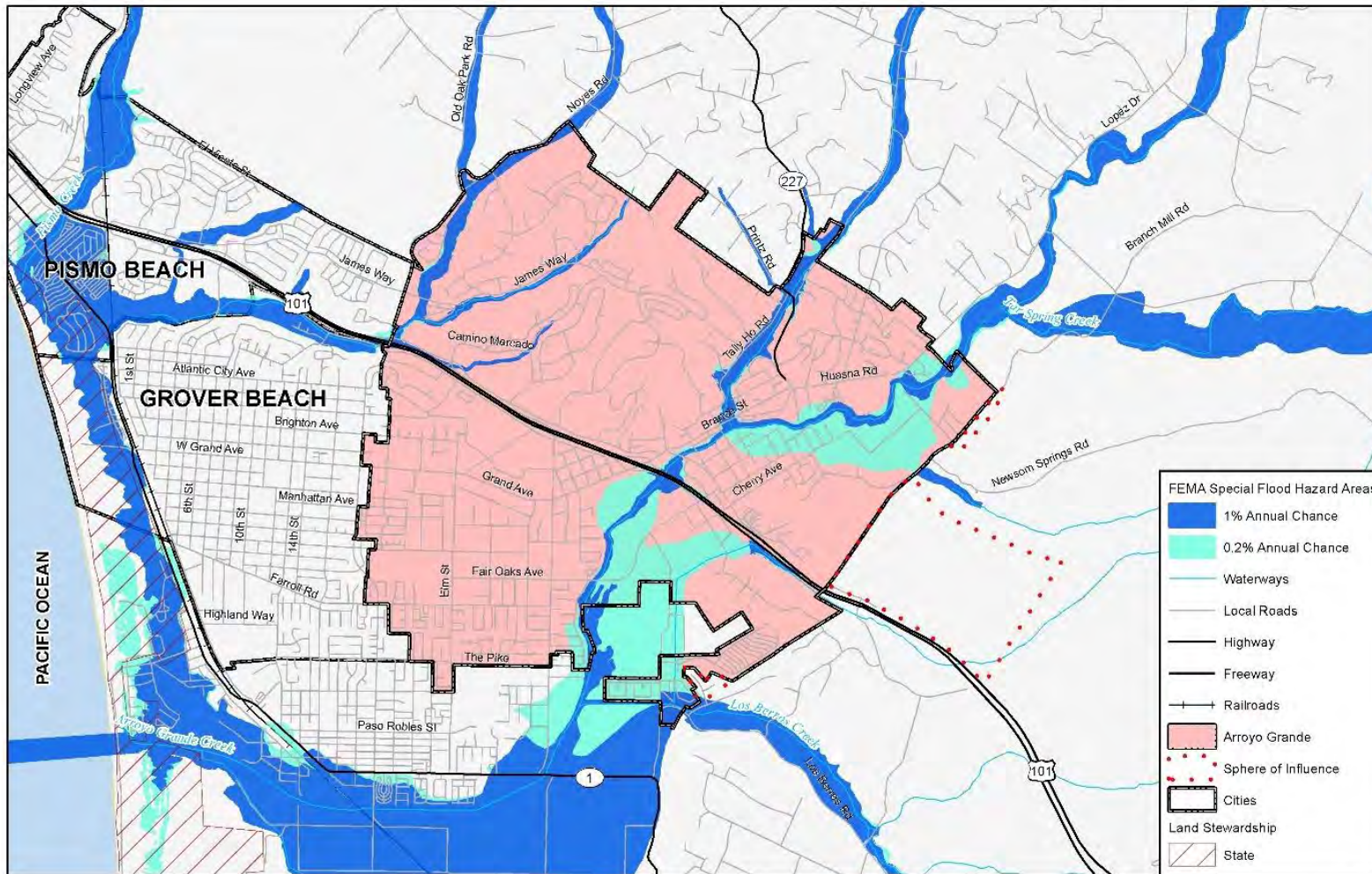
Values at Risk

A flood vulnerability assessment was completed during the 2019 update, following the methodology described in Section 5 of the Base Plan. Flood hazards for the City of Arroyo Grande are shown in Figure A.8. Table A.12 and Table A.13 summarize the values at risk in the City's 100-year and 500-year floodplain, respectively. These tables also detail loss estimates for each flood.





Figure A.8 City of Arroyo Grande's 100- and 500-Year Floodplains



Map compiled 6/2019;
intended for planning purposes only.
Data Source: San Luis Obispo County,
US Census TIGER Database, CA Open
Data Portal, BLM/California State Office,
LAFCO, FEMA NFHL

0 1 2 Miles



**Table A.12 City of Arroyo Grande's FEMA 1% Annual Chance Flood Hazard by Property Type**

Property Type	Parcel Count	Improved Value	Content Value	Total Value	Loss Estimate
Commercial	12	\$2,703,155	\$2,703,155	\$5,406,310	\$1,351,578
Government/Utilities	14	--	--	\$0	\$0
Other/Exempt/Misc.	12	\$2,088,004	--	\$2,088,004	\$522,001
Residential	125	\$21,076,591	\$10,538,296	\$31,614,887	\$7,903,722
Multi-Family Residential	15	\$2,421,310	\$1,210,655	\$3,631,965	\$907,991
Residential: Other	15	\$2,495,400	\$1,247,700	\$3,743,100	\$935,775
Vacant	3	\$264,167	--	\$264,167	\$66,042
TOTAL	196	\$31,048,627	\$15,699,806	\$46,748,433	\$11,687,108

Source: San Luis Obispo County Planning and Building Dept., Assessor's Office, ParcelQuest, Wood Plc Parcel Analysis

Table A.13 City of Arroyo Grande's FEMA 0.2% Annual Chance Flood Hazard by Property Type

Property Type	Parcel Count	Improved Value	Content Value	Total Value	Loss Estimate
Agricultural	2	\$59,896	\$59,896	\$119,792	\$29,948
Commercial	7	\$3,728,895	\$3,728,895	\$7,457,790	\$1,864,448
Government/Utilities	16	--	--	\$0	\$0
Other/Exempt/Misc.	19	\$2,937,762	--	\$2,937,762	\$734,441
Residential	417	\$76,542,670	\$38,271,335	\$114,814,005	\$28,703,501
Multi-Family Residential	12	\$2,352,869	\$1,176,435	\$3,529,304	\$882,326
Mobile/Manufactured Homes	2	\$3,093,854	\$1,546,927	\$4,640,781	\$1,160,195
Residential: Other	1	\$460,263	\$230,132	\$690,395	\$172,599
Vacant	1	\$972	--	\$972	\$243
TOTAL	477	\$89,177,181	\$45,013,619	\$134,190,800	\$33,547,700

Source: San Luis Obispo County Planning and Building Dept., Assessor's Office, ParcelQuest, Wood Plc Parcel Analysis

Based on this analysis, the City of Arroyo Grande has significant assets at risk to the 100-year and greater floods. There are 196 improved parcels located within the 100-year floodplain for a total value of over \$46 million. An additional 477 improved parcels valued at over \$134 million fall within the 500-year floodplain.

Applying the 25 percent damage factor as previously described in Section 5 of the Base Plan, there is a 1 percent chance in any given year of a 100-year flood causing roughly \$11 million in damage in the City of Arroyo Grande and a 0.2 percent chance in any given year of a 500-year flood causing roughly \$45 million in damage (combined damage from both floods). Figure A.9 shows the properties at risk to flooding in and around the City of Arroyo Grande in relation to the mapped floodplain, based on the parcels that have improvements and parcel centroids that intersect the flood hazard areas.



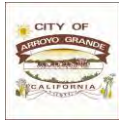
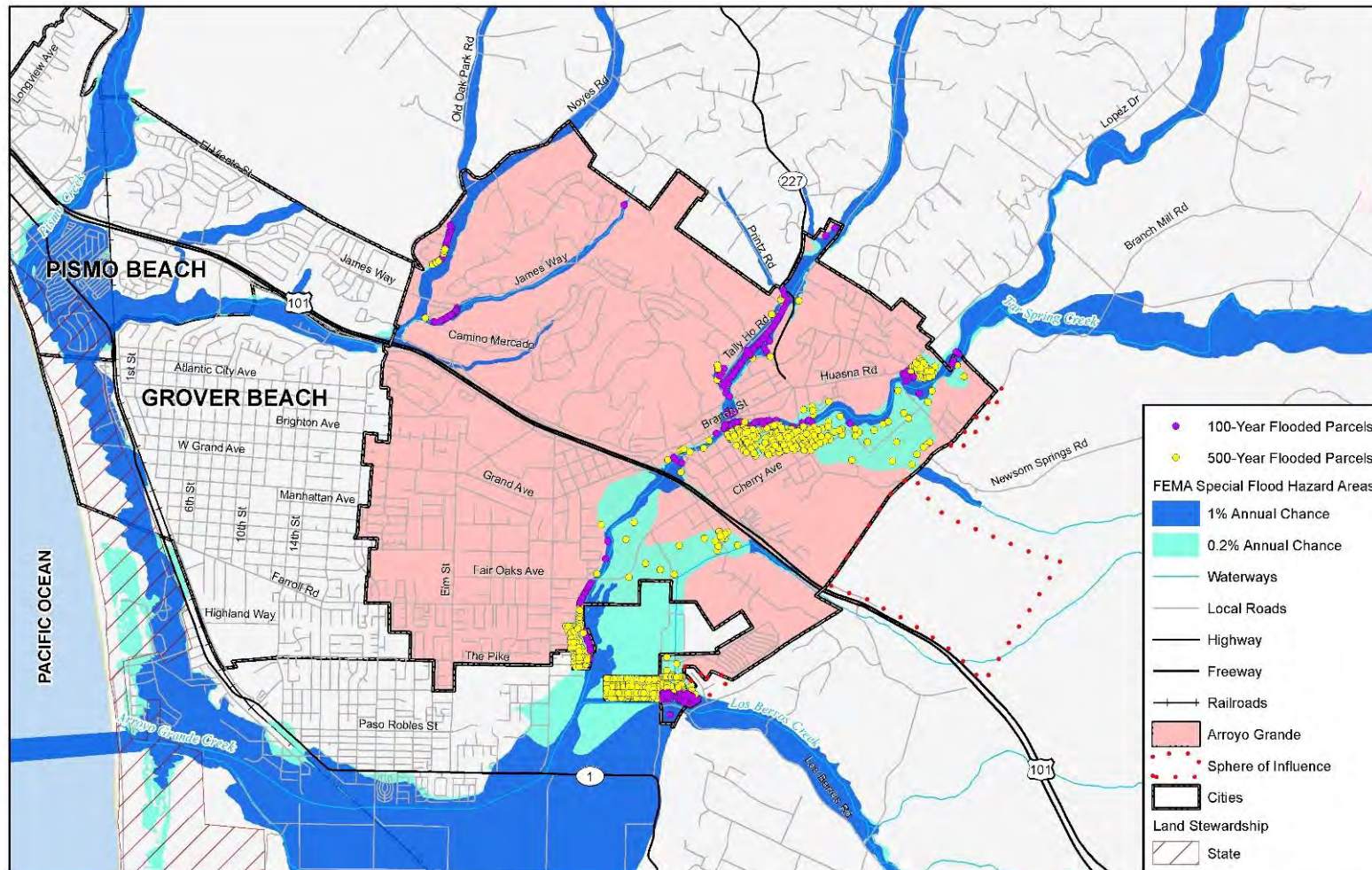


Figure A.9 Properties at Risk of Flood



Map compiled 6/2019;
intended for planning purposes only.
Data Source: San Luis Obispo County,
US Census TIGER Database, CA Open
Data Portal, BLM/California State Office,
LAFCO, FEMA NFHL, ParcelQuest

0 1 2 Miles





Limitations: This model may include structures in the floodplains that are elevated at or above the level of the base-flood elevation, which will likely mitigate flood damage. Also, the assessed values are well below the actual market values. Thus, the actual value of assets at risk may be significantly higher than those included herein.

Population at Risk

Using parcel data from the County and the digital flood insurance rate map, population at risk was calculated for the 100-year and 500-year floods based on the number of residential properties at risk and the average number of persons per household (2.47). The following are at risk to flooding in the City of Arroyo Grande:

- 100-year flood— 389 people
- 500-year flood— 1,084 people
- **Total flood**— 1,473 people

Insurance Coverage, Claims Paid, and Repetitive Losses

The City of Arroyo Grande joined the National Flood Insurance Program (NFIP) on September 19, 1984. NFIP Insurance data indicates that as of April 18, 2019, there were 110 flood insurance policies in force in the City with \$30,278,600 of coverage. Of the 110 policies, 105 were residential (101 for single-family homes and 4 for 2-4-unit homes) and 5 were nonresidential. There are 48 policies in A01-30 & AE zone and 2 policies in A zones. The remaining 60 are in B, C, and X zones.

There have been 19 historical claims for flood losses totaling \$412,456.68. All claims were for residential properties; 9 were in A zones and 2 were in B, C or X zones; and 10 were pre-FIRM structures (the one post-FIRM structure with a reported loss was in a B, C, or X zone). According to the FEMA Community Information System accessed 4/3/2019, the City has two Repetitive Loss properties and two Severe Repetitive Loss properties, which together are responsible for \$203,239 in payments.

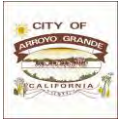
Critical Facilities at Risk

Critical facilities are those community components that are most needed to withstand the impacts of disaster as previously described. There are no critical facilities in the City's 100-year floodplain, but according to the risk assessment floods in Arroyo Grande tend to be more severe during a 500-year event. Thus, it is particularly important to note that the critical facilities in the 500-year floodplain are all facilities that serve vulnerable populations and thus should be given special attention. Table A.14 lists the critical facilities in the City's 500-year floodplains. The impact to the community could be great if these facilities are damaged or destroyed during a flood event.

Table A.14 Critical Facilities in the 500-year Floodplain: City of Arroyo Grande

Critical Facility Type	500-Year Floodplain
Day Care Facilities	1
Public Schools	2
TOTAL	3

Source: San Luis Obispo County Planning and Building Dept., Assessor's Office, ParcelQuest, Wood Plc Parcel Analysis



Wildfire

The City's mild climate and foggy days and nights typically help to maintain fuel moisture levels to a point that limits the potential for rapid fire spread. Despite the temperate climate, there have been past wildfire events that have put the City at risk. In 1985, the Los Pilitas Fire burned 84,271 acres in the mountains north of the City. The fire spread quickly, resulting in 10 homes being destroyed. Although the threat was short lived, if the correct combination of weather, topography and fuel existed, the potential for a wildfire within the City limit is possible. CAL FIRE has designated the City of Arroyo Grande as being at increased risk from wildfires, based on Fire Hazard Severity Zone mapping. Following the methodology described in the wildfire hazard Section 5 of the Base Plan, a wildfire vulnerability analysis for the City of Arroyo Grande was completed (see Figure A.10).

There are 11 properties in City of Arroyo Grande that are located within the moderate to very high severity zones (5 in the Moderate Severity Zone, 2 in the High Severity Zone, and 4 in the Very High Severity Zone), with a combined value of \$3,346,227 and impacting an estimated 18 persons (5 in the Moderate Severity Zone and 6 in the High and Very High Severity Zone). The following table quantifies the potential losses by wildfire severity zones and property type. There are no critical facilities in wildfire threat zones in Arroyo Grande.

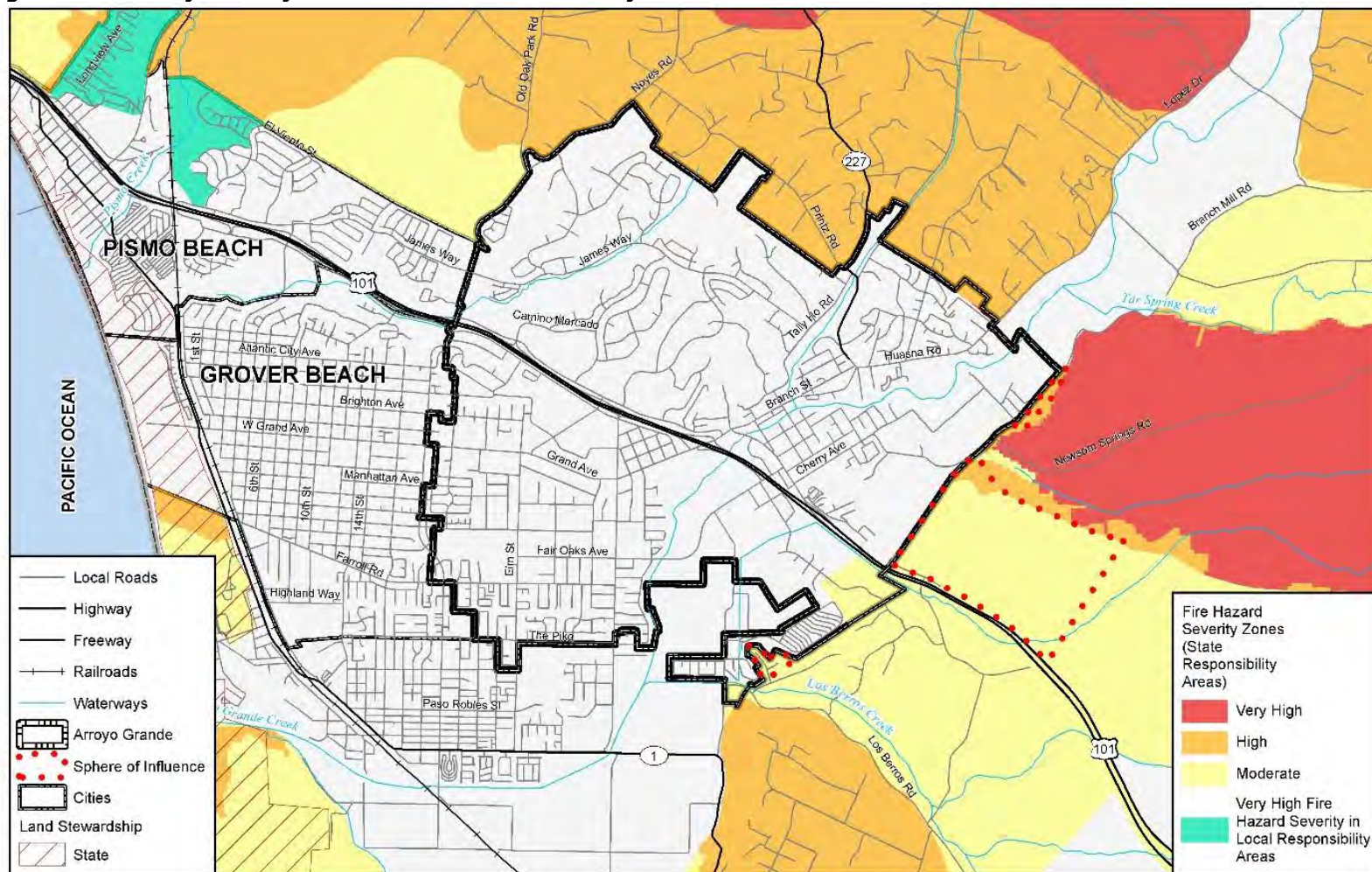
Table A.15 Properties Within Wildfire Severity Zones

Property Type	Parcel Count	Improved Value	Content Value	Total Value	Loss Estimate
Moderate Severity SRA Zone					
Other/Exempt/Misc.	2	\$1,686,663	--	\$1,686,663	\$1,686,663
Residential	3	\$434,648	\$217,324	\$651,972	\$651,972
Total	5	\$2,121,311	\$217,324	\$2,338,635	\$2,338,635
High Severity SRA Zone					
Government/Utilities	1	--	--	--	--
Other/Exempt/Misc.	1	--	--	--	--
Total	2	\$0	\$0	\$0	\$0
Very High Severity SRA Zone					
Residential	4	\$671,728	\$335,864	\$1,007,592	\$1,007,592
Total	4	\$671,728	\$335,864	\$1,007,596	\$1,007,596
Grand Total	11	\$2,793,039	\$553,188	\$3,346,231	\$3,346,231

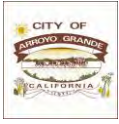
Source: San Luis Obispo County Planning and Building Dept., Assessor's Office, ParcelQuest, Wood Plc Parcel Analysis

The following map depicts the Fire Hazard Severity Zones in the City of Arroyo Grande.

Figure A.10 City of Arroyo Grande's Fire Hazard Severity Zones



Map compiled 5/2019;
intended for planning purposes only.
Data Source: San Luis Obispo County,
US Census TIGER Database, CA Open
Data Portal, BLM/California State Office,
LAFCO, CalFire



Human Caused: Hazardous Materials

The Cal OES Warning Center reports 161 hazardous materials incidents in the City of Arroyo Grande from 1994 through October 24, 2018; as noted in Section 5 of the County plan, this likely excludes a large number of unreported minor spills. This constitutes 9% of the hazardous materials incidents reported countywide during the same time frame and averages out to roughly 6.4 incidents per year. As noted in Section 5, only around 6% of reported hazardous materials incidents result in injuries, fatalities, or evacuations.

As shown in Figure 5-84 in the Base Plan, there are two EPA Risk Management Plan (RMP) facilities and three CalARP regulated facilities located in the City. Additionally, Arroyo Grande sits within the Emergency Planning Zone for the Diablo Canyon Nuclear Power Plant.

The Five Cities Fire Authority has located all petroleum, natural gas, combustible fuel pipelines and integrated that information into the City of Arroyo Grande Emergency Operations Plan. All personnel in the Five Cities Fire Authority have been trained to handle hazardous materials incidents in addition to having three Hazardous Materials Specialists on staff.

A.4 Capability Assessment

Capabilities are the programs and policies currently in use to reduce hazard impacts or that could be used to implement hazard mitigation activities. This capabilities assessment is divided into five sections: regulatory mitigation capabilities, administrative and technical mitigation capabilities, fiscal mitigation capabilities, mitigation outreach and partnerships, and other mitigation efforts. To develop this capability assessment, the jurisdictional planning representatives reviewed a matrix of common mitigation activities to inventory which of these policies or programs, and shared any updates or changes through the Arroyo Grande Data Collection Guide. The team then supplemented this inventory by reviewing additional existing policies, regulations, plans, and programs to determine if they contribute to reducing hazard-related losses.

During the plan update process, this inventory was reviewed by the jurisdictional planning representatives and Wood consultant team staff to update information where applicable and note ways in which these capabilities have improved or expanded. Additionally, in summarizing current capabilities and identifying gaps, the jurisdictional planning representatives also considered their ability to expand or improve upon existing policies and programs as potential new mitigation strategies. The City of Arroyo Grande's capabilities are summarized below.





A.4.1 Regulatory Mitigation Capabilities

Table A.16 City of Arroyo Grande Regulatory Mitigation Capabilities

Regulatory Tool	Yes/No	Comments
General plan	Yes	
Zoning ordinance	Yes	
Subdivision ordinance	Yes	
Growth management ordinance	No	Limited to Sphere of Influence
Floodplain ordinance	Yes	
Other special purpose ordinance (stormwater, water conservation, wildfire)	Yes	Stormwater Ordinance
Building code	Yes	
Fire department ISO rating	Yes	
Erosion or sediment control program	Yes	
Stormwater management program	Yes	
Site plan review requirements		
Capital improvements plan	Yes	
Economic development plan	Yes	
Local emergency operations plan	Yes	Under revision
Other special plans	Yes	Mills Act Ordinance; Climate Action Plan (2014)
Flood Insurance Study or other engineering study for streams	Yes	
Elevation certificates (for floodplain development)	Yes	

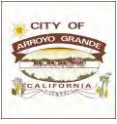
A.4.2 Administrative/Technical Mitigation Capabilities

Table A.17 identifies the personnel responsible for activities related to mitigation and loss prevention in Arroyo Grande.

Table A.17 City of Arroyo Grande Administrative/Technical Mitigation Capabilities

Personnel Resources	Yes/No	Department/Position
Planner/engineer with knowledge of land development/land management practices	Yes	Community Development Department: Assistant Planner, Planning Manager, Community Development Director
Engineer/professional trained in construction practices related to buildings and/or infrastructure	Yes	Community Development Department: City Engineer, Building Official
Planner/engineer/scientist with an understanding of natural hazards	Yes	Community Development Department: Planning Manager
Personnel skilled in GIS	Yes	Community Development Department: Program Analyst
Full time building official	Yes	Community Development Department: Building Official
Floodplain manager	Yes	City Engineer
Emergency manager	Yes	City Manager
Grant writer	No	
GIS Data Resources	Yes	Program Analyst





Personnel Resources	Yes/ No	Department/Position
(Hazard areas, critical facilities, land use, building footprints, etc.)		
Warning systems/services (Reverse 9-11, outdoor warning signals, social media)	Yes	Police Department, Fire Department, Deputy City Clerk

A.4.3 Fiscal Mitigation Capabilities

Table A.18 identifies financial tools or resources that the City could potentially use to help fund mitigation activities.

Table A.18 City of Arroyo Grande Fiscal Mitigation Capabilities

Financial Resources	Accessible/Eligible to Use (Yes/No)
Community Development Block Grants	Yes
Capital improvements project funding	Yes
Authority to levy taxes for specific purposes	Yes
Fees for water, sewer, gas, or electric services	Yes/No – gas and electric fees
Impact fees for new development	Yes
Incur debt through general obligation bonds	Yes
Incur debt through special tax bonds	Yes
Incur debt through private activities	No
Withhold spending in hazard prone areas	No

A.4.4 Mitigation Outreach and Partnerships

The City is currently working with the Five Cities Fire Authority, County and FireSafe Council to develop a city-specific Community Wildfire Protection Plan (CWPP). Mitigation efforts identified include education/outreach.

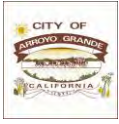
A.4.5 Other Mitigation Efforts

Through development of the Cherry Creek Estates, the City improved the Newsom Springs drainage, which now allows drainage through the Cherry Creek Estates development to Arroyo Grande Creek. Additionally, the City has been working with the Clark family on Highway 227 to develop a siltation area to allow easier removal of sediment in Tally Ho Creek and keep sediment from being delivered in Tally Ho Creek.

The City has also conducted fuel reduction projects to reduce wildfire threat.

A.4.6 Opportunities for Enhancement

Based on the capabilities assessment, the City of Arroyo Grande has several existing mechanisms in place that already help to mitigate hazards. In Arroyo Grande's 2015 LHMP the City conducted a "self-assessment of capability" in which they rated (limited to high) the degree of capability they believed the community had. The City noted having a high degree of capability for planning and regulatory capabilities, administrative and technical capabilities and political capability but a moderate rating for their fiscal capabilities. This may be an opportunity for the City to expand or improve on their fiscal capabilities and further protect the community. Other future improvements may include providing training for staff members related to hazards or hazard



mitigation grant funding in partnership with the County and Cal OES. Additional training opportunities will help to inform City staff members on how best to integrate hazard information and mitigation projects into their departments. Continuing to train City staff on mitigation and the hazards that pose a risk to the City of Arroyo Grande will lead to more informed staff members who can better communicate this information to the public.

A.5 Mitigation Strategy

A.5.1 Mitigation Goals and Objectives

The City of Arroyo Grande Planning Team determined the four goals from the 2015 HMP continue to be appropriate for this plan update, with the addition of a fifth goal specific to drought events. The following are the City of Arroyo Grande's 2019 mitigation goals:

- Goal 1 – Minimize the level of damage and losses due to flooding
- Goal 2 – Minimize the level of damage and losses due to earthquakes
- Goal 3 – Minimize the level of damage and losses due to wildland and structure fires
- Goal 4 – Minimize impacts to the community from dam inundation
- Goal 5 – Minimize impacts to the community from prolonged drought events

Continued Compliance with the National Flood Insurance Program

The City has been an NFIP participating community since 1984. In addition to the mitigation actions identified herein the City will continue to comply with the NFIP. Floodplain management is under the purview of the Community Development Department City Engineer. This includes ongoing activities such as enforcing local floodplain development regulations, including issuing permits for appropriate development in Special Flood Hazard Areas and ensuring that this development mitigated in accordance with the regulations. This will also include periodic reviews of the floodplain ordinance to ensure that it is clear and up to date and reflects new or revised flood hazard mapping.

A.5.2 Completed 2015 Mitigation Actions

During the 2019 planning process the City of Arroyo Grande Planning Team reviewed all the mitigation actions from the 2015 plan. During the 2019 planning process the Planning Team identified that of their sixteen (16) mitigation actions from 2015, six (6) of the actions are implemented annually and four (4) were noted as being in progress, demonstrating ongoing progress and building the community's resiliency to disasters.

A.5.3 Mitigation Actions

Table A.19 below describes all the annual implementation and in progress actions, the actions that were determined should be deferred as well new actions developed by the Planning Team. Actions were prioritized using the process described in subsection 7.2.1 of the Base Plan. Actions that mitigate losses to future development are denoted by an '*' in the table.



**Table A. 19 City of Arroyo Grande's Mitigation Action Plan**

ID	Hazard(s) Mitigated	Description/Background/Benefits	Lead Agency and Partners	Cost Estimate	Potential Funding	Priority	Timeline	Status/ Implementation Notes
AG.1	Flood	Residential-Commercial-Government Flood smart projects Residential: relocate, revise, building codes, and provide mitigation assistance	Recreation Maintenance Services, Community Development, Emergency Preparedness	\$100,000 to \$500,000	PDM Grant, General Funds, Capital Improvement Funds, Staff Time	High	Annual	Annual Implementation
AG.2	Flood	Residential-Commercial-Government Flood smart projects Commercial: relocate, revise, building codes, and provide mitigation assistance	Recreation Maintenance Services, Community Development, Emergency Preparedness	\$100,000 to \$500,000	PDM Grant, General Funds, Capital Improvement Funds, Staff Time	High	Annual	Annual Implementation
AG.3*	Flood	Conduct a cost to benefit analysis to consider expanding the capacity of the retention basins at various locations in the City of Arroyo Grande	Recreation Maintenance Services, Community Development, Emergency Preparedness	\$100,000 to \$500,000	PDM Grant, General Funds, Capital Improvement Funds, Staff Time	High	Deferred	Deferred; Limited availability of land to expand basins has resulted in deferral. Future analysis will focus on increasing depth of existing basins. Staff and fiscal constraints are ongoing.
AG.4*	Flood	Creation of Bio-Swales for water conservation	Recreation Maintenance Services, Community Development, Emergency Preparedness	\$10,000 to \$50,000	PDM Grant, General Funds, Capital Improvement Funds, Staff Time	High	Annual	Annual Implementation





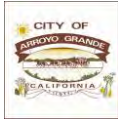
ID	Hazard(s) Mitigated	Description/Background/Benefits	Lead Agency and Partners	Cost Estimate	Potential Funding	Priority	Timeline	Status/ Implementation Notes
AG.5	Flood	Determine cost effective mitigation strategies for Newsom Springs area	Recreation Maintenance Services, Community Development, Emergency Preparedness	Little to no cost	PDM Grant, General Funds, Capital Improvement Funds, Staff Time	High	Deferred	Deferred; Limited CIP funding has been allocated to this project. In a catastrophic flood event, this area will be negatively impacted. Staff and fiscal constraints are ongoing.
AG.6	Flood	Conduct a cost to benefit analysis of a flood water diversion system for the City of Arroyo Grande's critical infrastructure and the flood vulnerable Commercial District	Recreation Maintenance Services, Community Development, Emergency Preparedness,	Less than \$10,000	PDM Grant, General Funds, Capital Improvement Funds, Staff Time	High	Deferred	Deferred; Limited availability of staff and fiscal resources.
AG.7	Earthquake	Identify and catalog seismically vulnerable structures	Emergency Preparedness	Little to no cost	PDM Grant, General Funds, Capital Improvement Funds, Staff Time	High	Deferred	Deferred; URM Buildings in the Village area should have been completely retrofitted. Unknown cataloging of potentially other structures throughout the city. Staff and fiscal constraints ongoing.





ID	Hazard(s) Mitigated	Description/Background/Benefits	Lead Agency and Partners	Cost Estimate	Potential Funding	Priority	Timeline	Status/ Implementation Notes
AG.8*	Earthquake	Notify public of location of earthquake faults	Emergency Preparedness	Little to no cost	PDM Grant, General Funds, Capital Improvement Funds, Staff Time	High	1 year	In progress; Link County of SLO OES Earthquake Plan to Fire Department & City websites.
AG.9	Earthquake	Notify public of location of Seismic vulnerable structures	Emergency Preparedness	Little to no cost	PDM Grant, General Funds, Capital Improvement Funds, Staff Time	High	1 year	In progress; Will be released upon completion of cataloging.
AG.10*	Fire	Encourage the 100' Defensible Space around structures in the Wildland Urban Interface	Fire Department, Community Development	Little to no cost	California Fire Safe Council, General Fund, Fire Prevention Grant	High	1 year	In progress; Adoption of Countywide Community Wildfire Protection Plan (CWPP). Pursue grant funding to complete city-specific CWPP Limited availability of staff and fiscal resources.
AG.11	Fire	Continue weed abatement program	Fire Department, Community Development	Little to no cost	California Fire Safe Council, General Fund, Fire Prevention Grant	High	Annual	Annual implementation
AG.12*	Fire	Enforce building codes and ordinances that eliminate the use of wood shake roofs	Fire Department,	Little to no cost	California Fire Safe Council, General Fund,	High	Annual	Annual implementation





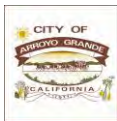
ID	Hazard(s) Mitigated	Description/Background/Benefits	Lead Agency and Partners	Cost Estimate	Potential Funding	Priority	Timeline	Status/ Implementation Notes
			Community Development		Fire Prevention Grant			
AG.13 *	Fire	Enforce codes and ordinances that require fire sprinkler fire systems in all new structures constructed.	Fire Department, Community Development	Little to no cost	California Fire Safe Council, General Fund, Fire Prevention Grant	High	Annual	Annual implementation
AG.14	Dam Failure	Create a community specific Evacuation Plan, including public outreach and education and identify public warning mechanisms and strategies.	Emergency Preparedness /Arroyo Grande Police Department	Less than \$10,000	PDM Grant, General Funds, Capital Improvement Funds, Staff Time	High	3-5 yrs.	In progress; Existing county-wide plans with evacuation components. County Fire Chiefs have identified community-specific evacuation plans as a strategic priority.
AG.15	Dam Failure	Exercise Evacuation Plan for effectiveness, including public warning elements.	Emergency Preparedness /Arroyo Grande Police Department	Less than \$10,000	PDM Grant, General Funds, Capital Improvement Funds, Staff Time	High	3-5 yrs.	Deferred; Will be considered upon community-specific evacuation plans.
AG.16	Dam Failure	Revise Evacuation plan as appropriate	Emergency Preparedness /Arroyo Grande Police Department	Less than \$10,000	PDM Grant, General Funds, Capital Improvement Funds, Staff Time	High	3-5 yrs.	Deferred; Will be considered upon community-specific evacuation plans.





ID	Hazard(s) Mitigated	Description/Background/Benefits	Lead Agency and Partners	Cost Estimate	Potential Funding	Priority	Timeline	Status/Implementation Notes
AG.17	Drought	Mitigate Drought Risk Through Water Availability Insurance. Continue to monitor well levels to prevent seawater intrusion while pursuing opportunities for regional recycled water projects that will result in groundwater injection.	Public Works; Community Development Department	\$30 million-\$50 million regionally; city's portion currently unknown	PDM Grant, General Funds, Capital Improvement Funds, Staff Time	Medium	Annual	New Benefits: Avoiding seawater intrusion; ensuring adequate water supply of the 5-cities region





A.6 Implementation and Maintenance

Moving forward, the City will use the mitigation action table in the previous section to track progress on implementation of each project. Implementation of the plan overall is discussed in Section 8 in the Base Plan.

A.6.1 Incorporation into Existing Planning Mechanisms

The information contained within this plan, including results from the Vulnerability Assessment, and the Mitigation Strategy will be used by the City to help inform updates and the development of local plans, programs and policies. The Engineering Division may utilize the hazard information when implementing the City's Community Investment Program and the Planning and Building Divisions may utilize the hazard information when reviewing a site plan or other type of development applications. The City will also incorporate this LHMP into the Safety Element of their General Plan, as recommended by Assembly Bill (AB) 2140.

As noted in Section 8 Plan Implementation, the HMPC representatives from Arroyo Grande will report on efforts to integrate the hazard mitigation plan into local plans, programs and policies and will report on these efforts at the annual HMPC plan review meeting.

A.6.2 Monitoring, Evaluation and Updating the Plan

The City will follow the procedures to monitor, review, and update this plan in accordance with San Luis Obispo County as outlined in Section 8 of the Base Plan. The City will continue to involve the public in mitigation, as described in subsection 8.3 of the Base Plan. The Fire Chief for the Five Cities Fire Authority will be responsible for representing the City in the County HMPC, and for coordination with City staff and departments during plan updates. The City realizes it is important to review the plan regularly and update it every five years in accordance with the Disaster Mitigation Act Requirements as well as other State of California requirements.





B.1 Community Profile

B.1.1 Mitigation Planning History and 2019 Process

This annex was created during the development of the 2019 San Luis Obispo County Hazard Mitigation Plan update. This Jurisdictional Annex builds upon the previous version of the City of Atascadero Local Hazard Mitigation Plan completed in September 2015. That previous mitigation plan was not incorporated into the City's General Plan, Municipal Code, or Fire Department Master Plan; however this updated mitigation plan will be integrated into those documents. A review of jurisdictional priorities found no significant changes in priorities since the last update.

The City's Local Planning Team (LPT) held responsibility for implementation and maintenance of the plan. The City Fire Chief is responsible for updating the plan.

Table B.1 Atascadero Hazard Mitigation Plan Revision Planning Group

Department or Stakeholder	Title
Atascadero Fire Department	Fire Chief
Atascadero Fire Department	Fire Marshal

More details on the planning process follow and how the jurisdictions, service districts and stakeholders participated, as well as how the public was involved during the 2019 update, can be found in Section 3 of the Base Plan.

B.1.2 Geography and Climate

Atascadero is located 17 miles inland from the Pacific coast and lies midway between Los Angeles and San Francisco on U.S. Highway 101 (US 101), about 220 miles from each city. The City is one of seven incorporated communities in San Luis Obispo County. The City consists of 26.15 square miles, is 879' above sea level and is located 40 miles west of the San Andreas Fault.

The City is situated in the southern portion of the Salinas River Valley. The Salinas River flows along the eastern City limits from south to north. Steep hills and canyons border the community on the west, and open rolling hills surround the City center. The City lies within an agricultural area where ranchlands are becoming vineyards to support the growing wine industry. Suburban residential development approved by San Luis Obispo County borders the City on the southern and eastern edges, and lower-density residential development lies to the north and west.

Atascadero is bordered on the west by the rugged mountainous ridges of the Santa Lucia Coastal Range, on the east by the low hills of the La Panza and Temblor Ranges, and on the north by the low hills and flat-topped mesas of the Diablo Range. The highest elevations in the vicinity are within the Santa Lucia Coastal Range, where many peaks are 2,000 to 3,400 feet above mean sea level.

The area has a Mediterranean climate with a wet season from October to early April and a dry summer season with low humidity. The City has an average annual precipitation of 17.31 inches. In winter, the average high temperatures range from the 50s to the 60s, with lows in the 30s. In summer, the average daily highs are in the 90s, with some days exceeding 100. Summertime lows are typically in the 60s and 70s.





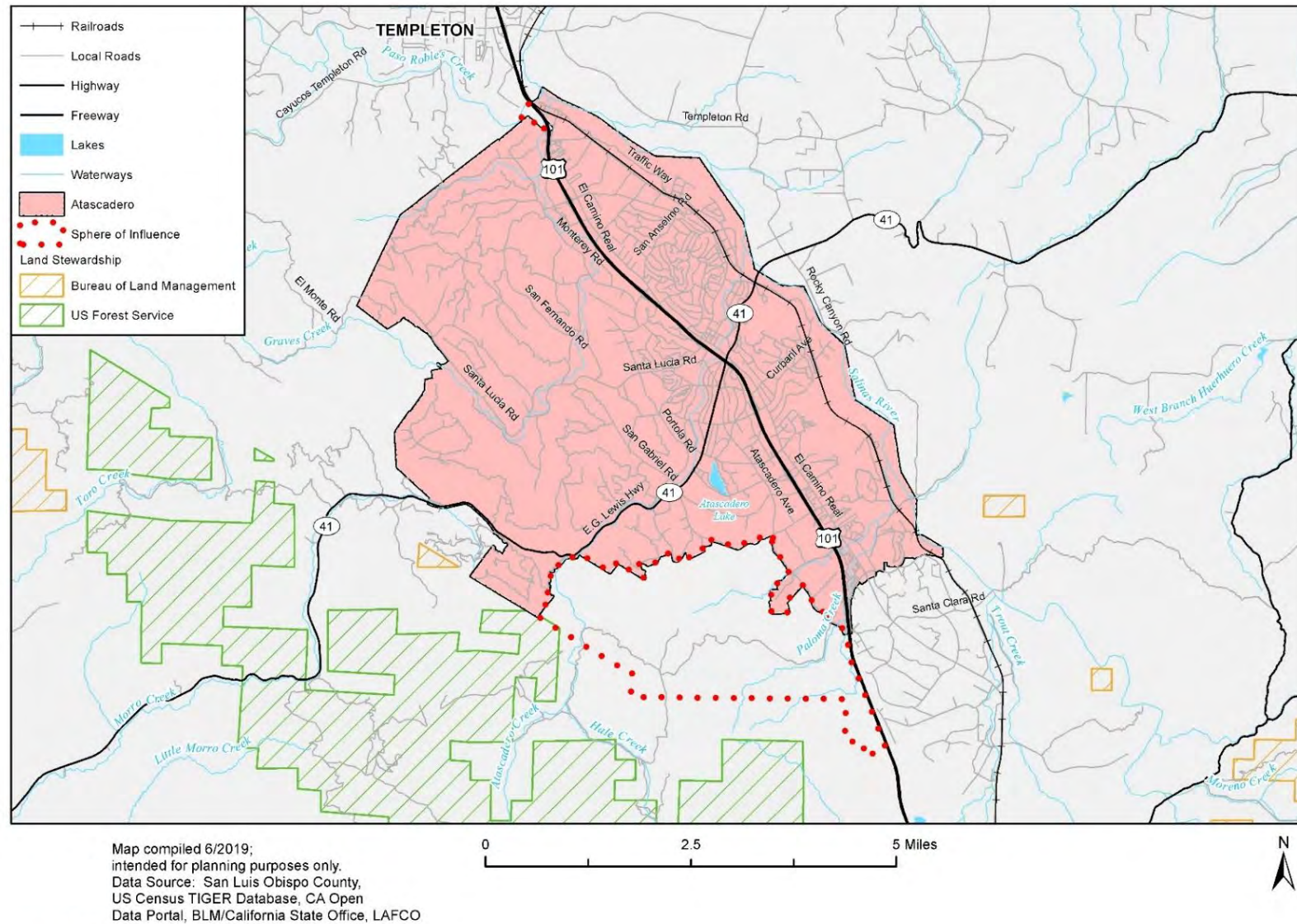
Atascadero is a General Law City operating within rules established by the California Legislature. The organizational structure of the local government is of the City Council–City Manager form. The City Manager, hired by the City Council, is responsible for planning, organizing, and directing all administrative activities such as enforcing municipal laws, directing the daily operations of the City, and preparing and observing the municipal budget. The City Council is composed of a Mayor and four City Council members elected at large by the citizens of Atascadero. The City Council acts upon all legislative matters concerning Atascadero, approving and adopting all ordinances, resolutions, contracts, and other matters requiring overall policy decisions and leadership.

Figure B.1 displays a map of the City of Atascadero planning area.





Figure B.1 The City of Atascadero





The U.S. Census Bureau estimated Atascadero's 2017 population as 29,797, a 3.5% increase from 28,792 in 2014. Table B.2 shows an overview of the City's key social and demographic characteristics taken from the California Department of Finance and the U.S. Census Bureau's American Community Survey.

Table B.2 Atascadero Demographic and Social Characteristics, 2014-2017

City of Atascadero	2014	2017	% Change
Population	28,792	29,797	3.5%
Median Age	42.2	38.2	-8.8%
Total Housing Units	11,559	12,106	4.7%
Housing Occupancy Rate	94.4%	96.9%	2.6%
% of Housing Units with no Vehicles Available	4%	3.9%	0%
Median Home Value	\$380,000	\$433,900	14.2%
Unemployment	3.3%	3.2%	0%
Mean Travel Time to Work (minutes)	22.8	22.9	0%
Median Household Income	\$66,342	\$72,240	9%
Per Capita Income	\$32,602	\$36,131	10.8%
% of Individuals Below Poverty Level	8.3%	7.5%	-9.6%
# of Households	11,065	11,431	3.3%
Average Household Size	2.5	2.5	0%
% of Population Over 25 with High School Diploma	92.1%	94.7%	2.8%
% of Population Over 25 with Bachelor's Degree or Higher	28.2%	32.4%	4.2%
% with Disability	15.2%	12.4%	-18%

Source: U.S. Census Bureau American Community Survey 2014-2017 3-Year Estimates, www.census.gov/

Table B.3 shows how Atascadero's labor force breaks down by occupation and industry estimates from the U.S. Census Bureau's 2017 American Community Survey.



**Table B.3 Atascadero Employment by Industry (2017)**

Industry	# Employed
Population (2017)	29,797
In Labor Force	15,296
Agriculture, forestry, fishing and hunting, and mining	4,576
Armed Forces	1,195
Construction	1,641
Manufacturing	1,312
Wholesale trade	1,306
Retail trade	961
Transportation and warehousing, and utilities	1,024
Information	727
Finance and insurance, and real estate and rental and leasing	492
Professional, scientific, and management, and administrative and waste management services	673
Educational services, and health care and social assistance	563
Arts, entertainment, and recreation, and accommodation and food services	219
Other services, except public administration	305
Public administration	279
Unemployed	23

Source: U.S. Census Bureau American Community Survey 2012-2017 5-Year Estimates, www.census.gov/

B.1.3 History

The area was originally home to the Salinan Indians. In the late 18th Century and early 19th Century, Spanish missionaries established 21 missions along the California coast, including the nearby Mission San Miguel Arcángel, and Mission San Luis Obispo de Tolosa. When Mexico won its independence from Spain, and California became a Mexican province, the Mexican government secularized the mission lands. Rancho Atascadero was granted to Trifon Garcia in 1842, and Rancho Asuncion was granted to Pedro Estrada in 1845.

Toward the end of the 19th century, J.H. Henry consolidated a number of tracts into the 23,770-acre Atascadero Ranch, which included all of the present planning area, except for Baron von Schroeder's Eaglet, now part of Eagle Ranch. In 1913, E.G. Lewis founded Atascadero as California's first planned community, consisting of 26.15 square miles of the original 38 square miles of the historic Atascadero Ranch, later known as the Colony.

The Atascadero Fire Department was first established as an all-volunteer department in 1915. In 1922 the Atascadero Fire Protection District was founded on the heels of a disastrous 5,000-acre wildland fire near the Eagle Ranch property. Originally the District was 7 square miles in area with a population less than 3,000. On February 4, 1926 Atascadero's first paid fire department was established.

In June 1979 the residents of Atascadero voted in favor of incorporation. The Fire District dissolved in 1979 when the department became an official part of the newly incorporated City. The 1980 General Plan became the first major planning document adopted by the newly incorporated City of Atascadero. In 1983, a new zoning ordinance was adopted to implement that plan.



B.1.4 Economy

Based on the 2017 American Community Survey (ACS) Atascadero's labor force is estimated to be 15,297 persons. The City's economic base primarily consists of employees within the educational services, health care and social services, which accounts for 29.9% of jobs. The City's largest employers include the Atascadero State Hospital and the Atascadero Unified School District (AUSD). The second largest type of industry in the City is the retail trade and services sector at 10.7% of employment. Unemployment has dropped from a historic high of 8.5% in 2010 due to the economic recession, to only 3.2% in 2017.

All consumable goods must be transported to the City via trucks utilizing U. S. Highway 101. It should be noted there are two rail spurs located in the undeveloped area of the County adjacent to the City. There is no airport in the City.

Table B.4 shows how Atascadero's labor force breaks down by occupation and industry based on estimates from the U.S. Census Bureau's 2017 American Community Survey.

Table B.4 City of Atascadero Employment by Industry (2017)

Industry	# Employed
Population (2017)	29,797
In Labor Force	15,296
Agriculture, forestry, fishing and hunting, and mining	219
Armed Forces	23
Construction	1,306
Manufacturing	961
Wholesale trade	305
Retail trade	1,641
Transportation and warehousing, and utilities	673
Information	279
Finance and insurance, and real estate and rental and leasing	563
Professional, scientific, and management, and administrative and waste management services	1,312
Educational services, and health care and social assistance	4,576
Arts, entertainment, and recreation, and accommodation and food services	1,195
Other services, except public administration	727
Public administration	1,024
Unemployed	492

Source: U.S. Census Bureau American Community Survey 2012-2017 5-Year Estimates, www.census.gov/

B.1.5 Population

The U.S. Census Bureau estimated the City's 2017 population as 29,797, up from 28,310 at the 2010 census. Table B.5 shows an overview of key social and demographic characteristics of the City taken from the U.S. Census Bureau's American Community Survey.



**Table B.5 City of Atascadero Demographic and Social Characteristics, 2012-2017**

City of Atascadero	2012	2017	% Change
Population	28,441	29,797	+4.8%
Median Age	41.9	38.2	-8.8%
Total Housing Units	11,559	12,106	4.7%
Housing Occupancy Rate	92.0%	96.9%	+4.9%
% of Housing Units with no Vehicles Available	4.1%	4.2%	+0.1%
Median Home Value	\$394,400	\$433,900	+10.0%
Unemployment	7.9%	3.2%	-4.7%
Mean Travel Time to Work (minutes)	21.1	22.9	+8.5%
Median Household Income	\$66,603	\$72,240	+8.5%
Per Capita Income	\$31,443	\$36,131	+14.9%
% of Individuals Below Poverty Level	10.7%	7.5%	-3.2%
# of Households	11,112	11,431	+2.9%
Average Household Size	2.46	2.57	+4.5%
% of Population Over 25 with High School Diploma	92.0%	94.7%	+2.7%
% of Population Over 25 with Bachelor's Degree or Higher	28.2%	32.4%	+4.2%
% with Disability	12.0%	11.6%	-0.4%
% Speak English less than "Very Well"	3.8%	2.8%	-1.0%

Source: U.S. Census Bureau American Community Survey 2012-2017 5-Year Estimates, www.census.gov/

Note that the City's median household and per capita income are both above average for the County and the State, although the median home price is slightly below average for the County. The percentage of individuals living below the poverty level (7.5%) is almost half that of the County (13.8%), or California as a whole (15.1%). The number of individuals who speak English less than very well is also significantly below the County and State averages (6.8% and 18.4% respectively).

B.1.6 Development Trends

Prior to the City's incorporation, San Luis Obispo County guided growth in the unincorporated County through its General Plan. San Luis Obispo County adopted the General Plan in 1968 and by 1972 developed more stringent growth standards in accordance with State of California (State) planning standards. With the incorporation of Atascadero in 1979, the newly formed Planning Commission adopted the 1980 General Plan and subsequently, in 1983, a new zoning ordinance. The City updated the General Plan in the mid-1980s and adopted a revised version in 1992.

The General Plan 2025, adopted in 2002, is the most recent version of the City's Plan. This version readopted the Guiding Community Goals and introduced the Smart Growth Principles and General Plan Framework Principles. In addition, the Preferred General Plan Land Use Alternatives identified a build-out population of approximately 36,000.

The majority of commercial activity, including 3 million square feet of commercial and industrial buildings, takes place along El Camino Real, Morro Road, and near US 101 interchanges. The historic downtown, located in the City center, is surrounded by residential neighborhoods (with approximately 8,000 dwelling units) that transition into low-density rural areas west of US 101 and open space, public recreation, and public facilities east of US 101 (Figure B.2).

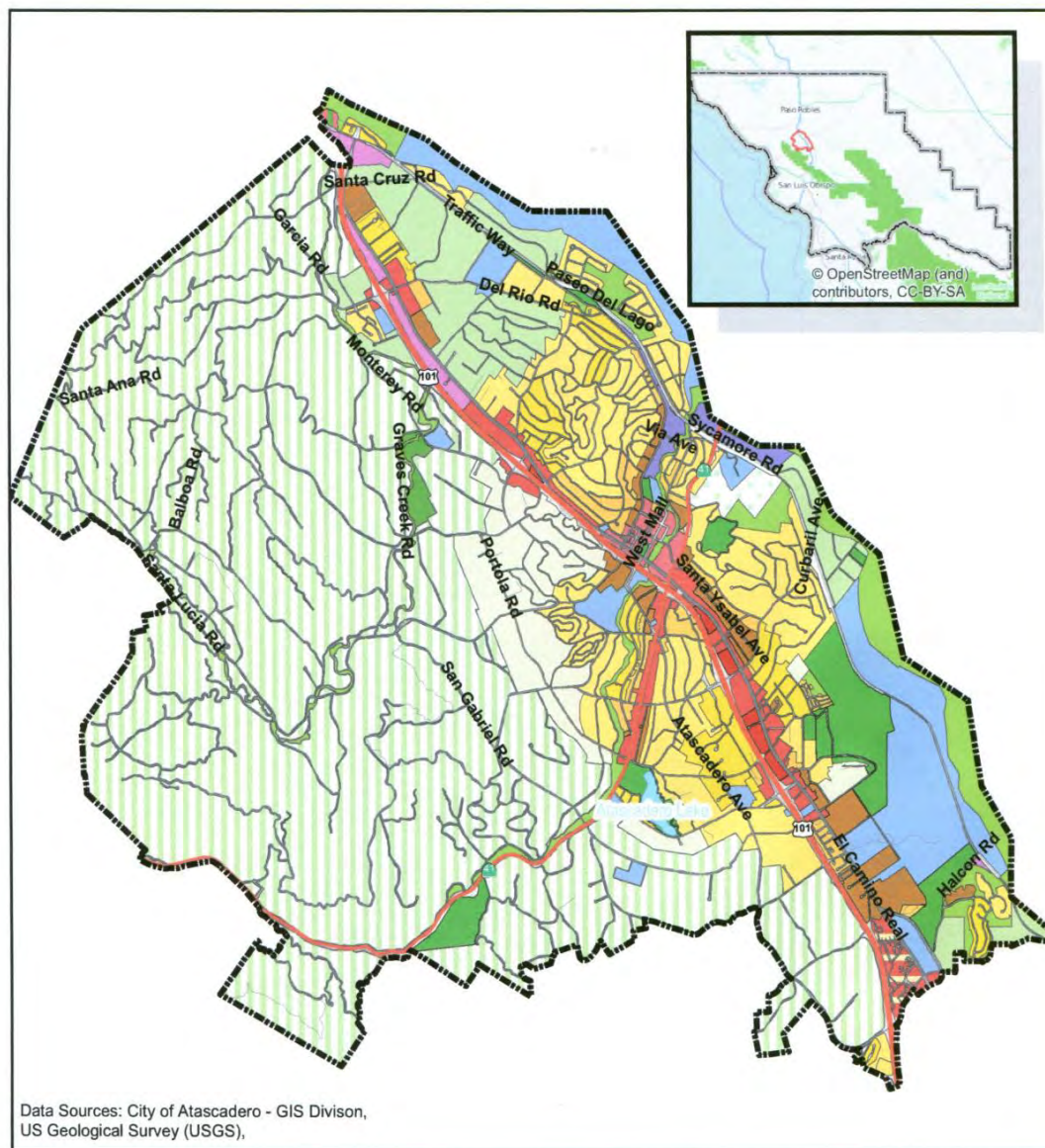


The General Plan 2025 identifies approximately 400 acres of the Eagle Ranch area as the primary area of future growth. The area is located outside of the current City's western boundaries but within the Urban Reserve Line, an area within the Colony boundary that is planned for urban and suburban uses with City services and facilities. In addition to the Eagle Ranch development project, the General Plan 2025 identifies small residential and commercial development projects in the northern and southeastern portions of the City limits (Figure B-3).

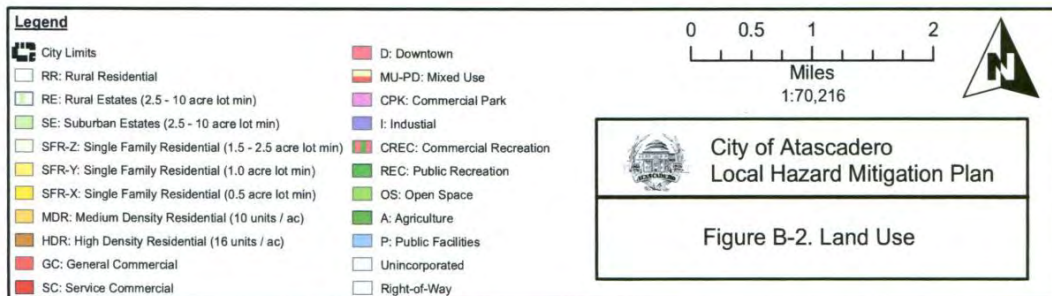




Figure B.2 City of Atascadero Land Use Map



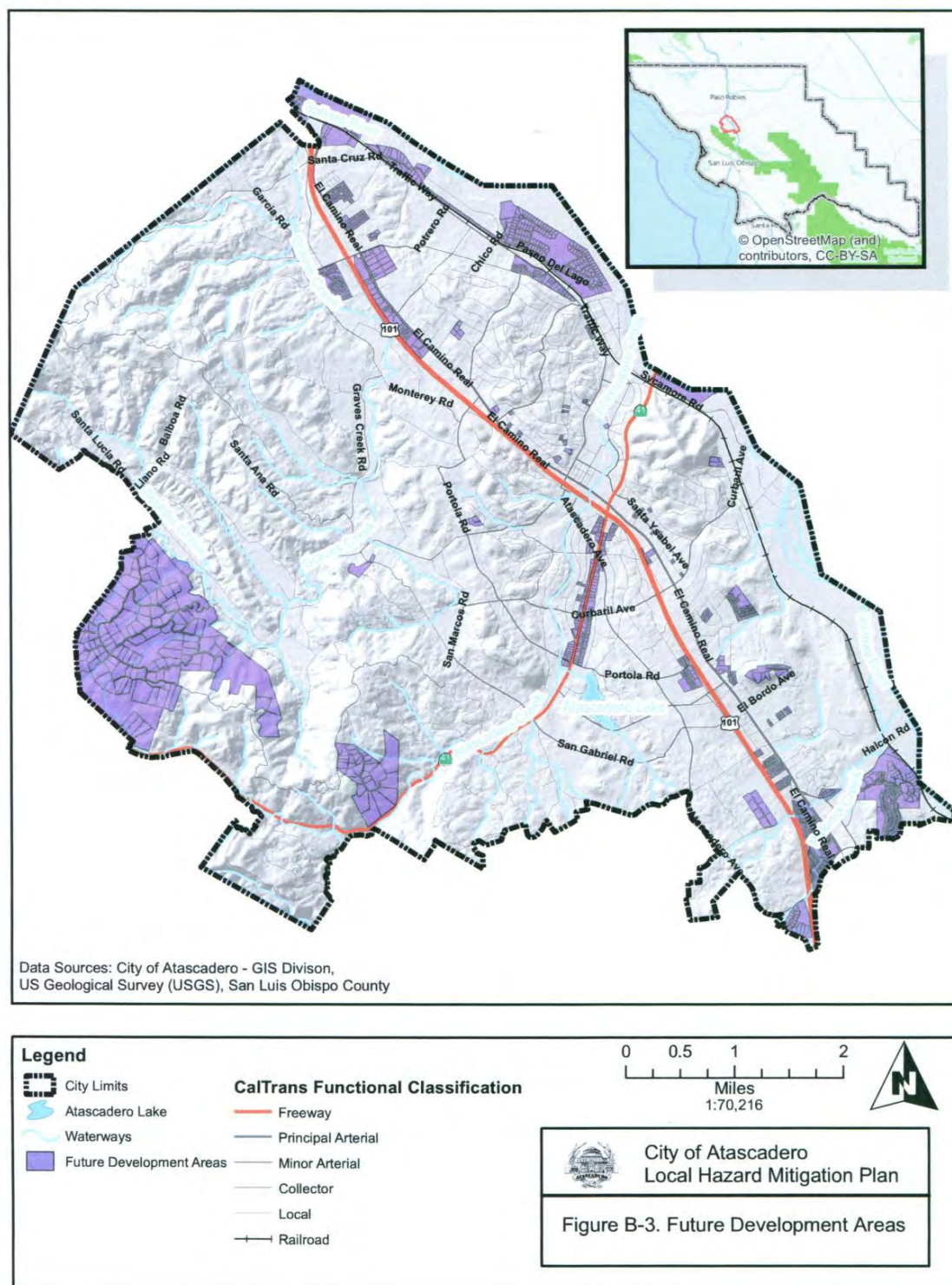
Data Sources: City of Atascadero - GIS Division,
US Geological Survey (USGS),



Source: City of Atascadero 2014 Local Hazard Mitigation Plan



Figure B.3 City of Atascadero Future Development Areas



Source: City of Atascadero 2014 Local Hazard Mitigation Plan



B.2 Hazard Identification and Summary

The Atascadero planning team identified the hazards that affect the City and summarized their frequency of occurrence, spatial extent, potential magnitude, and significance specific to their community (see Table B.6). There are no hazards that are unique to Atascadero. The overall hazard significance takes into account the geographic area, probability and magnitude as a way to identify priority hazards for mitigation purposes. 'NI' in the table means not identified. This is discussed further in the Vulnerability Section.

Table B.6 City of Atascadero – Hazard Summaries

Hazard	Geographic Area	Probability of Future Occurrence	Magnitude/Severity (Extent)	Overall Significance
Adverse Weather: Thunderstorm/Heavy Rain/Hail/Lighting/Dense Fog/Freeze	NI	NI	NI	NI
Adverse Weather: High Wind/Tornado	Extensive	Likely	Limited	Low
Adverse Weather: Extreme Heat	NI	NI	NI	NI
Agricultural Pest Infestation and Disease	Limited	Highly Likely	Negligible	Medium
Biological Agents (naturally occurring)	Extensive	Occasional	Critical	Medium
Coastal Storm/Coastal Erosion/Sea Level Rise	N/A	N/A	N/A	N/A
Dam Incidents	Limited	Unlikely	Limited	Low
Drought and Water Shortage	Extensive	Likely	Limited	Medium
Earthquake	Limited	Unlikely	Limited	Low
Flood	Significant	Occasional	Critical	Medium
Landslides and Debris Flow	Significant	Likely	Significant	Medium
Subsidence	Significant	Likely	Negligible	Low
Tsunami and Seiche	N/A	N/A	N/A	N/A
Wildfire	Extensive	Likely	Critical	High
Human Caused: Hazardous Materials	Significant	Highly Likely	Negligible	Medium
Geographic Area Limited: Less than 10% of planning area Significant: 10-50% of planning area Extensive: 50-100% of planning area Probability of Future Occurrences Highly Likely: Near 100% chance of occurrence in next year or happens every year. Likely: Between 10 and 100% chance of occurrence in next year or has a recurrence interval of 10 years or less. Occasional: Between 1 and 10% chance of occurrence in the next year or has a recurrence interval of 11 to 100 years.		Magnitude/Severity (Extent) Catastrophic—More than 50 percent of property severely damaged; shutdown of facilities for more than 30 days; and/or multiple deaths Critical—25-50 percent of property severely damaged; shutdown of facilities for at least two weeks; and/or injuries and/or illnesses result in permanent disability Limited—10-25 percent of property severely damaged; shutdown of facilities for more than a week; and/or injuries/illnesses treatable do not result in permanent disability		



Unlikely: Less than 1% chance of occurrence in next 100 years or has a recurrence interval of greater than every 100 years.

Negligible—Less than 10 percent of property severely damaged, shutdown of facilities and services for less than 24 hours; and/or injuries/illnesses treatable with first aid

Significance

Low: minimal potential impact

Medium: moderate potential impact

High: widespread potential impact

B.3 Vulnerability Assessment

The intent of this section is to assess Atascadero's vulnerability separately from that of the planning area as a whole, which has already been assessed in subsection 5.3 Risk Assessment in the main plan. This vulnerability assessment analyzes the population, property, and other assets at risk to hazards ranked of medium or high significance that may vary from other parts of the planning area.

The information to support the hazard identification and risk assessment was based on the City's previous LHMP. A Local Hazard Mitigation Plan Update Guide and associated worksheets was distributed to each participating municipality or special district to complete during update process in 2019. Information collected was analyzed and summarized in order to identify and rank all the hazards that could impact anywhere within the County, as well as to rank the hazards and identify the related vulnerabilities unique to each jurisdiction.

Each participating jurisdiction was in support of the main hazard summary identified in the Base Plan (See Table 5-2). However, the hazard summary rankings for each jurisdictional annex may vary slightly due to specific hazard risk and vulnerabilities unique to that jurisdiction. Identifying these differences helps the reader to differentiate the jurisdiction's risk and vulnerabilities from that of the overall County.

Note: The hazard "Significance" reflects overall ranking for each hazard and is based on the City of Atascadero's HMPC member input from the Data Collection Guide and the risk assessment developed during the planning process (see subsection 5.1 of the Base Plan), which included a more detailed qualitative analysis with best available data.

The hazard summaries in Table B.6 above reflect the hazards that could potentially affect the City. The discussion of vulnerability for each of the following hazards is located in subsection B.3.2 Estimating Potential Losses. Based on this analysis, the priority hazard (High Significance) for mitigation is wildfire. Those of Medium or High significance for the City of Atascadero are identified below.

- Agricultural Pest Infestation and Disease
- Biological Agents (naturally occurring)
- Drought or Water Shortage
- Flood
- Landslide and Debris Flow
- Human Caused: Hazardous Materials

Other Hazards

Hazards assigned a significance rating of Low and which do not differ significantly from the County ranking (e.g., Low vs. High) are not addressed further in this plan and are not assessed individually for specific vulnerabilities in this section. In the City of Atascadero, those hazards include dam incidents, earthquakes, and land subsidence.





Additionally, the City's Committee members decided to rate several hazards as Not Applicable (N/A) to the planning area due to a lack of exposure, vulnerability, and/or no probability of occurrence. Those hazards deemed not applicable to the City of Atascadero include coastal storm/coastal erosion/sea level rise, and tsunami/seiche.

B.3.1 Assets at Risk

This section considers Atascadero's assets at risk, including values at risk, critical facilities and infrastructure, historic assets, economic assets and growth and development trends.

Values at Risk

The following data on property exposure is derived from the San Luis Obispo County 2019 Parcel and Assessor data. This data should only be used as a guideline to overall values in the City as the information has some limitations. The most significant limitation is created by Proposition 13. Instead of adjusting property values annually, the values are not adjusted or assessed at fair market value until a property transfer occurs. As a result, overall value information is likely low and does not reflect current market value of properties. It is also important to note that in the event of a disaster, it is generally the value of the infrastructure or improvements to the land that is of concern or at risk. Generally, the land itself is not a loss. Table B.7 shows the exposure of properties (e.g., the values at risk) broken down by property type for the City of Atascadero.

Table B.7 2019 Property Exposure for the City of Atascadero by Property Types

Property Type	Parcel Count	Improved Value	Content Value	Total Value
Commercial	565	\$191,651,882	\$191,651,882	\$383,303,764
Government/Utilities*	152	\$840	--	\$840
Other/Exempt/Misc.	327	\$57,551,872	--	\$57,551,872
Residential	7,661	\$1,670,488,610	\$835,244,305	\$2,505,732,915
Multi-Family Residential	1,083	\$252,413,520	\$126,206,760	\$378,620,280
Mobile/Manufactured Homes	131	\$13,702,740	\$6,851,370	\$20,554,110
Residential: Other	264	\$96,286,718	\$48,143,359	\$144,430,077
Industrial	29	\$10,189,075	\$15,283,613	\$25,472,688
Vacant	86	\$19,001,171	--	\$19,001,171
Total	10,298	\$2,311,286,428	\$1,223,381,289	\$3,534,667,717

Source: Wood Plc analysis based on ParcelQuest and San Luis Obispo County Assessor's Office data 2019;

* Improved value is not accurate as these properties are exempt in the assessor's data.



Critical Facilities and Infrastructure

A critical facility may be defined as one that is essential in providing utility or direction either during the response to an emergency or during the recovery operation. See Section 5 of the Base Plan for more details on the definitions and categories of critical facilities.

An inventory of critical facilities in the City of Atascadero from San Luis Obispo County GIS is provided in Table B.8 and illustrated in Figure B.3.

Table B.8 City of Atascadero's Critical Facilities

Facility Type	Counts
Day Care Facilities	13
Emergency Medical Service Stations	2
Fire Stations	3
Hospitals	1
Local Law Enforcement	1
Nursing Homes	8
Private Schools	2
Public Schools	9
Supplemental Colleges	1
Urgent Care	1
Power Plants	2
Microwave Service Towers	2
TV Analog Station Transmitters	1
Energy Commission Facilities	1
Total	47

Source: San Luis Obispo County Planning & Building, HIFLD 2017

Table B.9 below lists additional critical facilities and infrastructure identified by the planning team.




Table B.9 Critical Facilities and Infrastructure Identified by Atascadero Planning Team

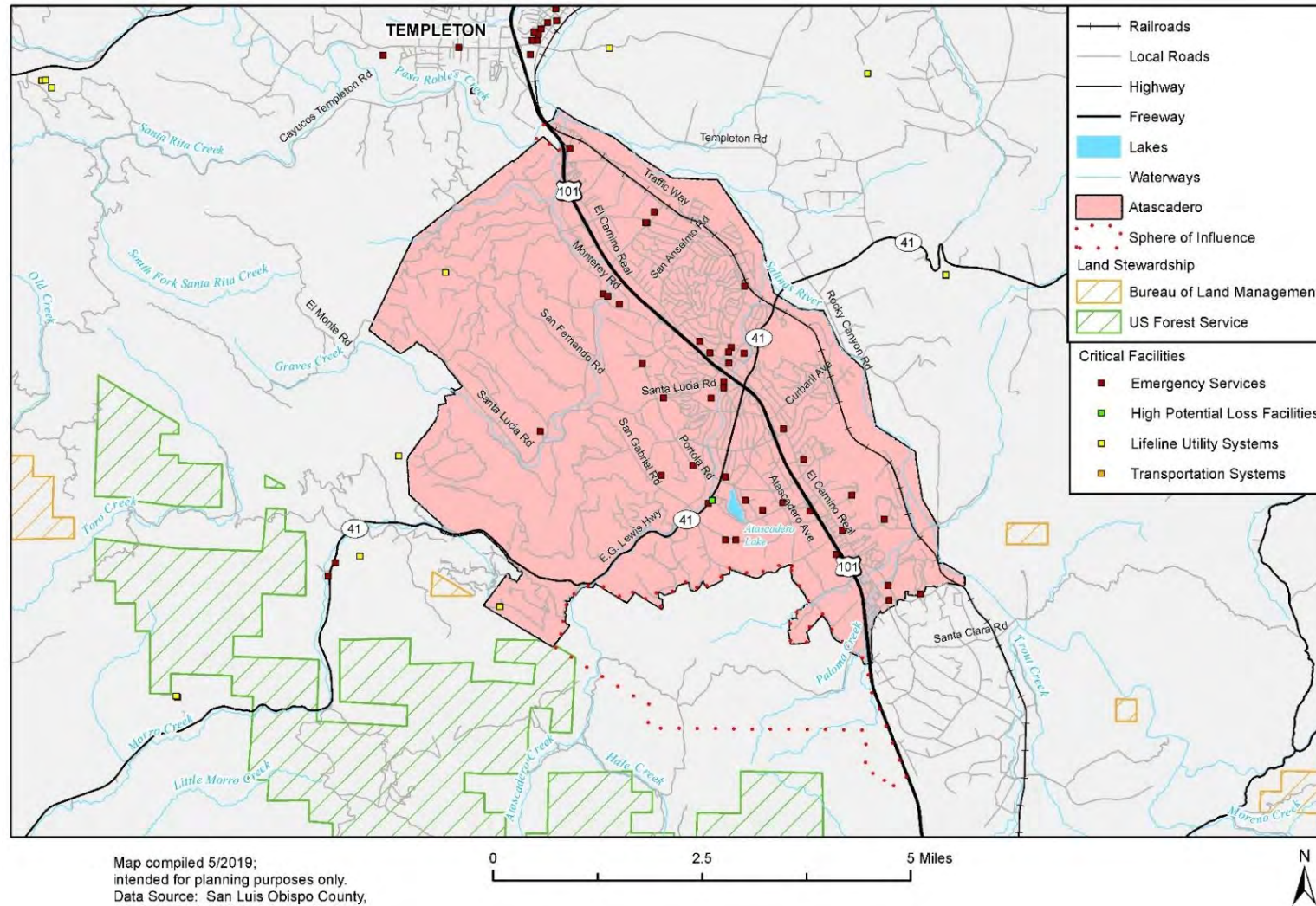
Category	Facility	Number	Estimated Value Per Structure/Mile
City Hall	City Hall	1	\$43,400,000
	City Hall Annex (now Successor Agency)	1	\$3,393,884
Police and Fire Stations	Fire Station #1	1	\$1,777,972
	Fire Station #2	1	\$1,167,090
	Atascadero Police Department	1	\$2,168,594
Other City-Owned Facilities	Lake Pavilion	1	\$2,528,924
	Charles Paddock Zoo	1	\$2,352,377
	Ranger House	1	\$ 91,689
	Youth Center	1	\$9,902,817
	Skate Park	1	\$ 850,448
	Paloma Creek Park Facilities	4	\$ 351,765
	Pine and Chalk Mountain Towers	2	\$ 517,423
Potable Water and Wastewater	Wastewater Treatment Plant	1	\$2,705,059
	Sewer Lift Stations	12	\$ 874,267
	Sewer Lift Station 5 Buildings	4	\$1,279,465
Infrastructure	State and Federal Highways (miles)	21.277	\$109,967
	Major Arterials (miles)	27.044	\$14,279
	Railroads (miles)	7.608	\$10,532
	Bridges	14	\$5,930,990

Source: City of Atascadero 2014 Local Hazard Mitigation Plan





Figure B.3 Critical Facilities in Atascadero





Transportation and Lifeline Facilities

Major transportation and lifeline facilities are located adjacent to US Highway 101 and State Highway 41, which traverse through Atascadero, as well as the rail line that runs through the eastern edge of the City. Damages to these transportation corridors would not only impact Atascadero but the entire region.

Historic and Cultural Resources

The National Register of Historic Places contains three sites in the City of Atascadero:

- Administration Building, Atascadero Colony, 6500 Palma Ave.
- Archeological Site 4 SLO 834, Address Restricted
- Atascadero Printery, 6351 Olmeda

There are no California State Historical Landmarks and two California Register of Historical Resources properties located in Atascadero: The Printery Building and Historic Administration Building.

Other significant historic or cultural resources identified by the planning team include the Adobe Springs on Traffic Way and numerous homes built during the Atascadero Colony era.

Natural Resources

Natural resources are important to include in benefit-cost analyses for future projects and may be used to leverage additional funding for projects that also contribute to community goals for protecting sensitive natural resources. Awareness of natural assets can lead to opportunities for meeting multiple objectives. For instance, protecting wetlands areas protects sensitive habitat as well as attenuates and stores floodwaters.

Key natural assets in the City include Atascadero, Graves, Paloma, and Boulder creeks in addition to the Salinas River. The city also contains vast areas of native oak woodland.

B.3.2 Estimating Potential Losses

Note: This section details vulnerability to specific hazards of high or medium significance, where quantifiable, and/or where (according to HMPC member input) it differs from that of the overall County.

Table B.7 above shows Atascadero's exposure to hazards in terms of number and value of structures. San Luis Obispo County's parcel and assessor data was used to calculate the improved value of parcels. The most vulnerable structures are those in the floodplain (especially those that have been flooded in the past), unreinforced masonry buildings, and buildings built prior to the introduction of modern-day building codes. Impacts of past events and vulnerability to specific hazards are further discussed below (see subsection 5.1 Hazard

Identification for more detailed information about these hazards and their impacts on San Luis Obispo County as a whole).

Agricultural Pest Infestation and Disease

The City has 57 properties at risk from tree mortality, as shown in the following table. The City does not have any critical facilities in high tree mortality areas.



**Table B.10 Atascadero Properties in High Tree Mortality Areas**

Property Type	Parcel Count	Improved Value
Commercial	1	\$89,244
Multi-Family Residential	8	\$343,621
Residential	48	\$14,462,885
TOTAL	57	\$14,895,750

Source: San Luis Obispo County Planning and Building Dept., Assessor's Office, ParcelQuest, Wood Plc Parcel Analysis

Biological Agents (Naturally Occurring)

The City of Atascadero's risk and vulnerability to this hazard does not differ substantially from that of the County overall.

Drought or Water Shortage

The Atascadero Mutual Water Company manages the City's water supply that consists of 17 active wells that pump from the Atascadero sub-basin of the Paso Robles Groundwater Basin and both riparian and appropriated Salinas River underflow. As of 2015, maximum well production is 12.9 million gallons per day. While the primary basin, the Paso Robles Groundwater Basin, is experiencing decline in many areas, the Atascadero Sub-basin is a hydro-geologically distinct sub-basin that is separated from the primary basin by the Rinconada Fault line and has not experienced the level of decline when compared to the Paso Robles Ground Water Basin.

With approval of the Nacimiento Water Project, the AMWC has been allocated an additional 3,000 AFY, with a flow rate of 3.48 million gallons per day (mgd). The Nacimiento Water Project broke ground in 2007 and the construction of the infrastructures needed to deliver water to the Atascadero area is complete. AMWC began taking deliveries of water in the summer of 2012. The City analyzed the capacity of existing water resources and determined that given the existing water supply and that which will result from the Nacimiento Water Project, the existing water supply is not a constraint to growth in the City and is available for all vacant zones within the City to accommodate the City's RHNA. However, as a result of the Nacimiento Water Project connection fees, water rates have increased gradually to help pay for the cost of the additional water source.

Historically, recycled water has not been used as a source of water in Atascadero.

Flood

In Atascadero, the most common type of flooding event is riverine flooding, also known as overbank flooding. Riverine floodplains range from narrow, confined channels in the steep valleys of mountainous and hilly regions, to wide, flat areas in plains and agricultural regions. The amount of water in the floodplain is a function of the size and topography of the contributing watershed, the regional and local climate, and land use characteristics. Flooding in steep, mountainous areas is usually confined, strikes with less warning time, and has a short duration. Larger rivers typically have longer, more predictable flooding sequences and broad floodplains.

In addition to riverine flooding, Atascadero is susceptible to flash flooding in smaller watersheds. Flash flood is a term widely used by experts and the general population, but there is no single definition or clear means of distinguishing flash floods from other riverine floods. Flash floods are generally understood to involve a rapid rise in water level, high velocity, and large amounts of debris, which can lead to significant damage that includes the tearing out of trees, undermining of buildings and bridges, and scouring of new channels. The intensity of flash flooding is a function of the intensity and duration of rainfall, steepness of the watershed, stream gradients, watershed vegetation, natural and artificial flood storage areas, and configuration of the streambed and



floodplain. Dam failure may also lead to flash flooding. Urban areas are increasingly subject to flash flooding due to the removal of vegetation, installation of impermeable surfaces over ground cover, and construction of drainage systems. Wildland fires that strip hillsides of vegetation and alter soil characteristics may also create conditions that lead to flash floods and debris flows.

Finally, localized flooding may occur outside of recognized drainage channels or delineated floodplains due to a combination of locally heavy precipitation, increased surface runoff, and inadequate facilities for drainage and storm water conveyance. Such events frequently occur in flat areas and in urbanized areas with large impermeable surfaces. Local drainage may result in “nuisance flooding,” in which streets or parking lots are temporarily closed; and minor property damage. Because the effects are not widespread, and damage is typically minimal, they are not studied in detail as part of the LHMP.

The most serious flood events on record in Atascadero occurred during storms in the early months of 1969, 1993, 1995, and 2001.

Flooding during 1969 was the most damaging. Two floods occurred, one at the end of January and the second at the end of February. During this two-month period, a local rain gage recorded an accumulated precipitation total of 39.79 inches. As a result of these storms, the Salinas River reached a discharge of over 28,000 cubic feet per second and reached a stage of 23.8 feet, almost 5 feet above flood stage. The San Luis Obispo Telegram-Tribune of January 25, 1969, described the Salinas Rive as “on rampage.”

During January 1993, winter storms again delivered excessive precipitation; the monthly rainfall total at a local rain gage was nearly 14 inches. During the March 1995 flood, local rain gages recorded a monthly total of 16.48 inches of rain. In the fall of 1996 and the winter of 1997 Atascadero received 7” of rain. As a result of the 1996 Highway 58 Wildland fire the City experiences isolated minor flooding. In early 2001, rain gages recorded a total of 20.2 inches of rain over a three-month period.

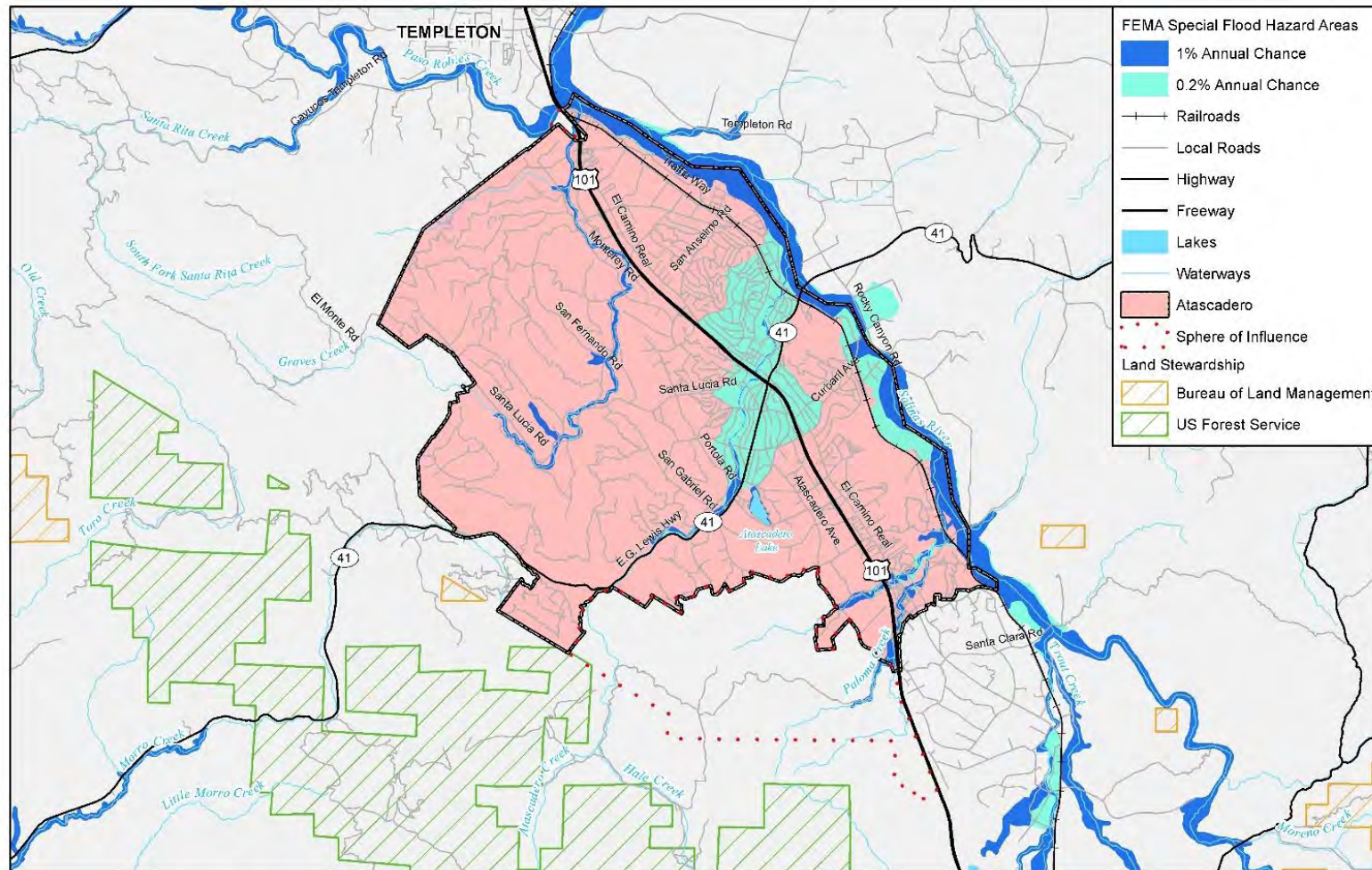
Values at Risk

Following the methodology described in subsection 5.3.11, a flood map for the City of Atascadero was created (see Figure B.5). Tables B.13 and B.14 summarize the values at risk in the City’s 100-year and 500-year floodplain, respectively. These tables also detail loss estimates for each flood. Note that the potential loss increases significantly with the 500-year or 0.2% annual chance flood.





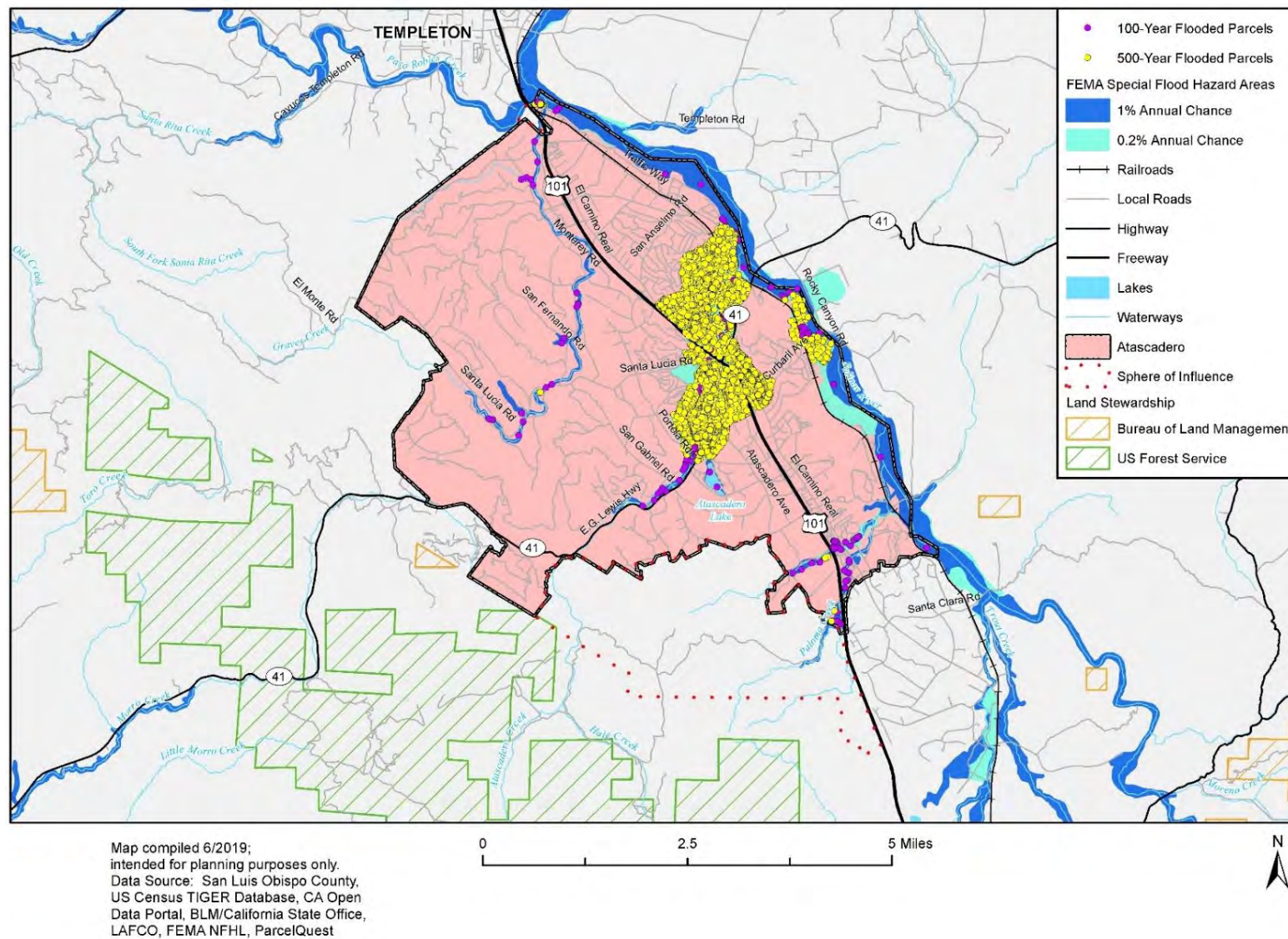
Figure B.4 City of Atascadero 100- and 500-Year Floodplains



Map compiled 6/2019;
intended for planning purposes only.
Data Source: San Luis Obispo County,
US Census TIGER Database, CA Open
Data Portal, BLM/California State Office,
LAFCO, FEMA NFHL

0 2.5 5 Miles



**Figure B.5 City of Atascadero Parcels at Risk of Flooding**



Population at Risk

Table B.11 City of Atascadero 1% (100 year) Floodplain Risk

Property Type	Parcel Count	Improved Value	Content Value	Total Value	Loss Estimate	Population
Commercial	8	\$2,737,870	\$2,737,870	\$5,475,740	\$1,368,935	--
Government/Utilities	21	--	--	\$0	\$0	--
Other/Exempt/Misc.	19	--	--	\$0	\$0	--
Residential	65	\$16,171,213	\$8,085,607	\$24,256,820	\$6,064,205	163
Multi-Family Residential	25	\$2,792,438	\$1,396,219	\$4,188,657	\$1,047,164	63
Industrial	2	\$1,298,159	\$1,947,239	\$3,245,398	\$811,349	--
TOTAL	140	\$22,999,680	\$14,166,934	\$37,166,614	\$9,291,654	226

Source: San Luis Obispo County Planning and Building Dept., Assessor's Office, ParcelQuest, Wood Plc Parcel Analysis

Table B.12 City of Atascadero 0.2% (500 year) Floodplain Risk

Property Type	Parcel Count	Improved Value	Content Value	Total Value	Loss Estimate	Population
Commercial	345	\$92,955,971	\$92,955,971	\$185,911,942	\$46,477,986	--
Government/Utilities	45	--	--	\$0	\$0	--
Other/Exempt/Misc.	96	\$25,780,069	--	\$25,780,069	\$6,445,017	--
Residential	1,619	\$252,691,386	\$126,345,693	\$379,037,079	\$94,759,270	4,064
Multi-Family Residential	545	\$103,163,270	\$51,581,635	\$154,744,905	\$38,686,226	1,368
Mobile/Manufactured Homes	4	\$676,967	\$338,484	\$1,015,451	\$253,863	10
Residential: Other	128	\$29,443,443	\$14,721,722	\$44,165,165	\$11,041,291	321
Industrial	3	\$965,221	\$1,447,832	\$2,413,053	\$603,263	--
Vacant	22	\$4,602,571	--	\$4,602,571	\$1,150,643	--
TOTAL	2,807	\$510,278,898	\$287,391,336	\$797,670,234	\$199,417,558	5,763

Source: San Luis Obispo County Planning and Building Dept., Assessor's Office, ParcelQuest, Wood Plc Parcel Analysis

Insurance Coverage, Claims Paid, and Repetitive Losses

The City of Atascadero has been a participant in the National Flood Insurance Program since 1982. The Atascadero CID # is 060700. The FIRM panel identification is 06079C0831G. The City of Atascadero will continue to participate and remain in compliance with the National Flood Insurance Program. (NFIP).

Table B.13 City of Atascadero NFIP Insurance Policy Information

Policies	Insurance in Force	No. of Paid Losses	Total Losses Paid
107	\$13,507,500	18	\$259,834

Source: FEMA National Flood Insurance Program Community Information System

FEMA Community Information System shows that as of April 2019 the City of Atascadero has three Repetitive Loss (RL) properties, which have been responsible for \$190,889.43 in NFIP claims. The City does not have any Severe Repetitive Loss (SRL) properties.

Atascadero does not participate in the Community Rating System (CRS).

Critical Facilities at Risk

None of the City's identified critical facilities are located in the 1% Annual (100 year) Floodplain. Critical facilities located in the 0.2% Annual (500-year) Floodplain are shown in the following table.

**Table B.14 City of Atascadero Critical Facilities in the 0.2% (500-year) Floodplain**

Facility Type	Counts
Day Care Facilities	4
Emergency Medical Service Stations	1
Fire Stations	1
Local Law Enforcement	1
Nursing Homes	1
Private Schools	1
Public Schools	3
Urgent Care	1
Day Care Facilities	4
TOTAL	13

Source: San Luis Obispo County Planning & Building, HIFLD 2017

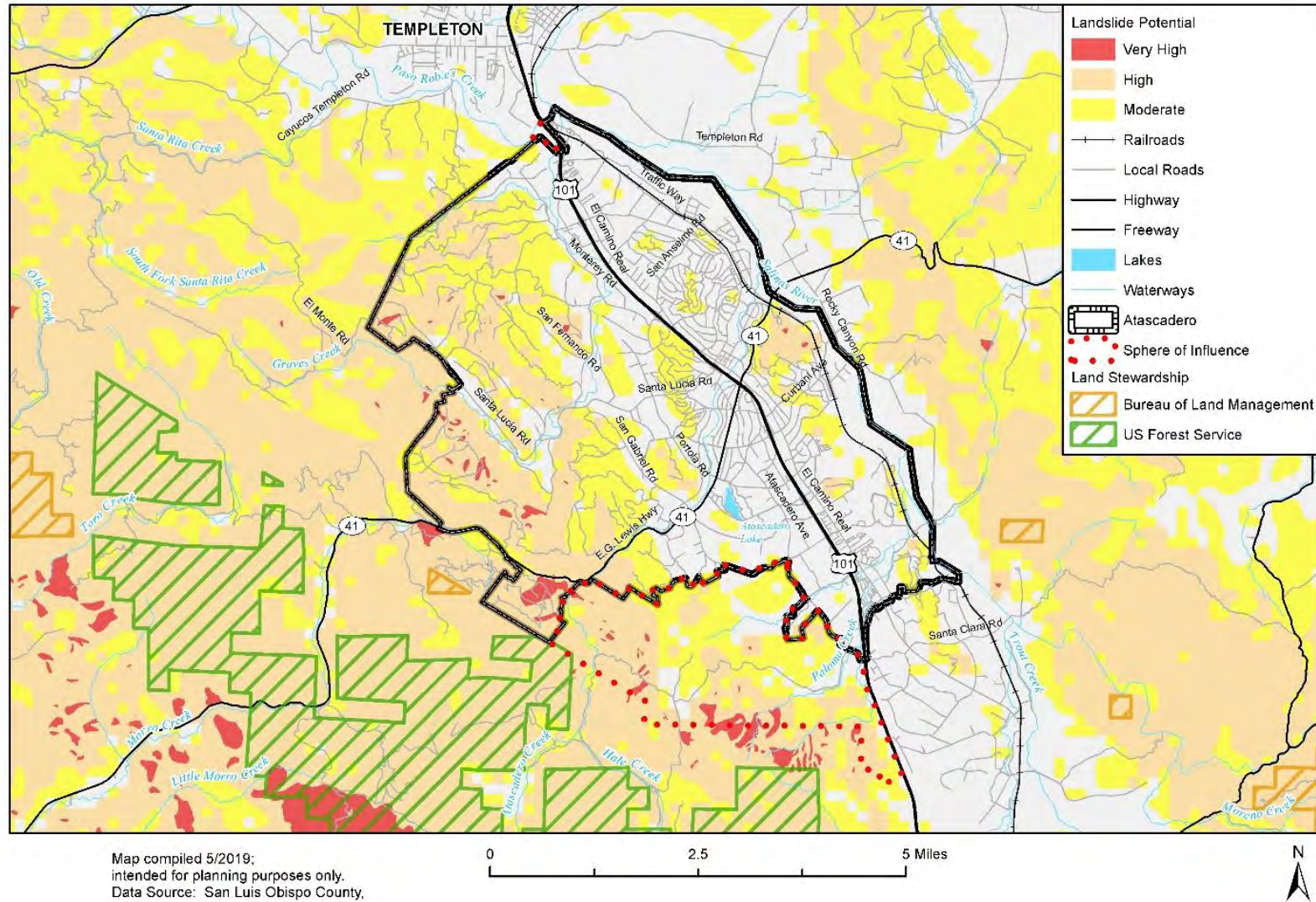
Landslide and Debris Flow

Similar to much of San Luis Obispo County, Atascadero is considered to have a moderate to high potential of landslides in certain areas of the City. Slope instability in the City generally increases with steepness and distance from the Salinas River, with areas of steep terrain that consist of fractured soil or thin layers of clay that are susceptible to erosion and land subsidence. The only areas of the City that are considered to have a very high risk of landslides are small locations in the far southwest end of the City. There are also several high and very high-risk areas outside of the City boundary that have potential to impact the City.





Figure B.6 City of Atascadero Landslide Risk





Atascadero has 2,081 properties and 5 critical facilities at high or moderate risk of landslides, as shown in the following tables.

Table B.15 Atascadero Properties at High Risk of Landslide

Property Type	Property Count	Improved Value
Government/Utilities	11	--
Other/Exempt/Misc.	15	--
Residential	427	\$133,187,615
Multi-Family Residential	7	\$1,052,734
Mobile/Manufactured Homes	1	\$66,235
Vacant	8	\$1,799,933
TOTAL	469	\$136,106,517

Source: San Luis Obispo County Planning and Building Dept., Assessor's Office, ParcelQuest, Wood Plc Parcel Analysis

Table B.16 Atascadero Properties at Moderate Risk of Landslide

Property Type	Property Count	Improved Value
Commercial	3	\$869,000
Government/Utilities	14	--
Other/Exempt/Misc.	12	\$14,559
Residential	1,480	\$385,770,153
Multi-Family Residential	41	\$14,871,989
Mobile/Manufactured Homes	4	\$497,938
Residential: Other	44	\$6,983,678
Vacant	14	\$1,433,068
TOTAL	1,612	\$410,440,385

Source: San Luis Obispo County Planning and Building Dept., Assessor's Office, ParcelQuest, Wood Plc Parcel Analysis

Table B.17 Atascadero Critical Facilities at Risk from Landslide

Critical Facility Type	Count	Risk
TV Analog Station Transmitters	1	High
Day Care Facilities	1	Moderate
Microwave Service Towers	2	Moderate
Nursing Homes	1	Moderate
TOTAL	5	

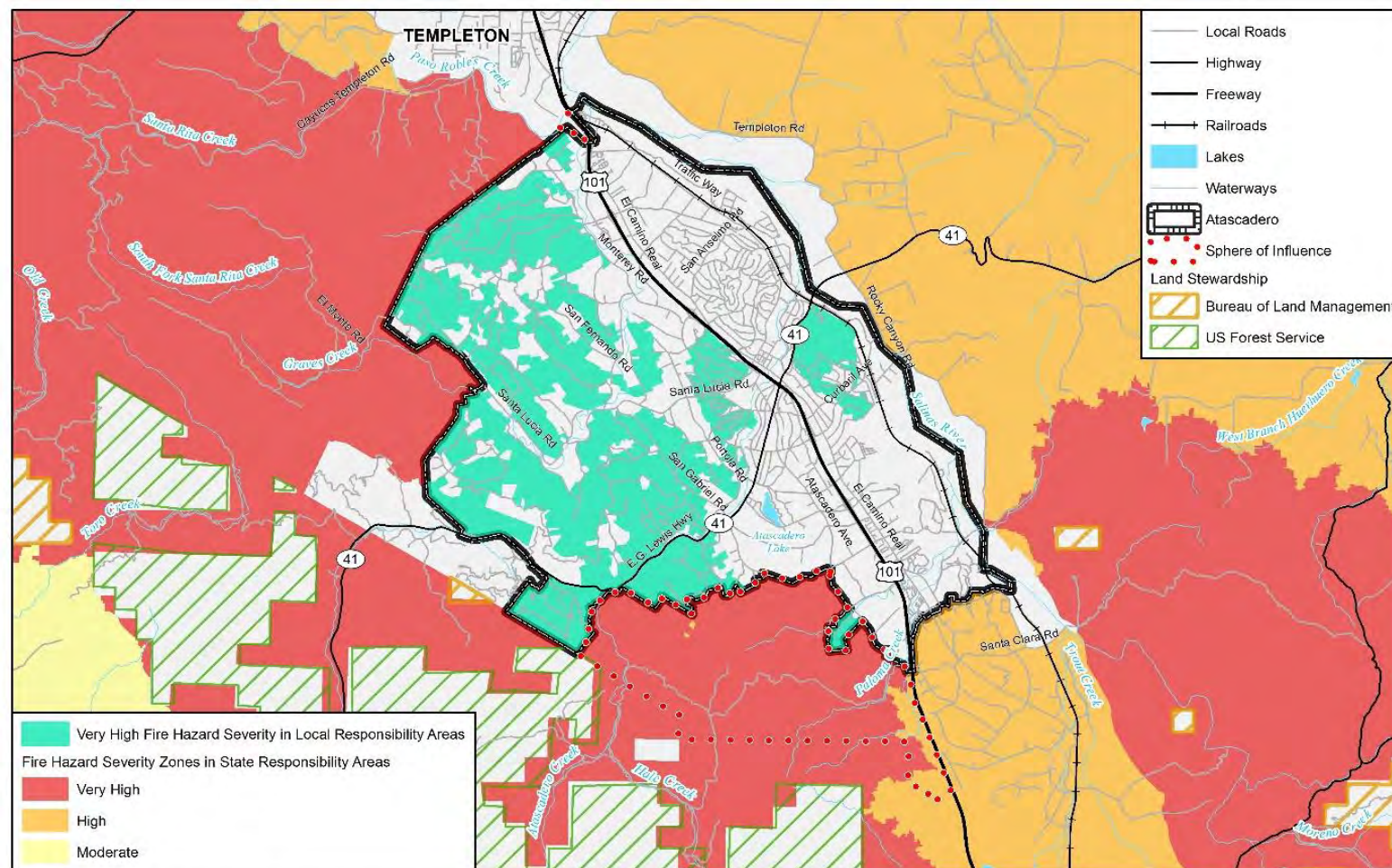
Source: San Luis Obispo County Planning & Building, HIFLD 2017

Wildfire

Wildfire is a high significance hazard for the City of Atascadero. The City has 1594 properties and three critical facilities located in High or Very High Severity SRA Zones, as shown in Figure B.7, Table B.18, and Table B.19. Additionally, the City is almost completely surrounded by high and very high severity zones, as shown in Figure B.7.



Figure B.7 City of Atascadero Fire Hazard Severity Zones



wood.
Map compiled 12/2019;
intended for planning purposes only.
Data Source: San Luis Obispo County,
US Census TIGER Database, CA Open
Data Portal, BLM/California State Office,
LAFCO, CalFire

0 2.5 5 Miles



**Table B.18 City of Atascadero Properties in Very High Severity SRA Zones**

Property Type	Property Count	Improved Value	Content Value	Total Value	Loss Estimate	Population
Government/Utilities	15	\$840	--	\$855	\$855	--
Other/Exempt/Misc.	17	\$102,000	--	\$102,017	\$102,017	--
Residential	1527	\$403,167,906	\$201,583,953	\$604,753,386	\$604,753,386	3,833
Multi-Family Residential	6	\$696,431	\$348,216	\$1,044,653	\$1,044,653	15
Mobile/Manufactured Homes	5	\$716,049	\$358,025	\$1,074,079	\$1,074,079	13
Residential: Other	2	\$739,216	\$369,608	\$1,108,826	\$1,108,826	5
Vacant	22	\$3,139,161	--	\$3,139,183	\$3,139,183	--
TOTAL	1594	\$408,561,603	\$202,659,801	\$611,222,998	\$611,222,998	3,865

Source: San Luis Obispo County Planning and Building Dept., Assessor's Office, ParcelQuest, Wood Plc Parcel Analysis

Table B.19 City of Atascadero Critical Facilities at Risk from Wildfire

Critical Facility Type	Count	Risk
Nursing Homes	1	Very High
TV Analog Station Transmitters	1	Very High
Day Care Facilities	1	High
TOTAL	3	

Source: San Luis Obispo County Planning & Building, HIFLD 2017

Human Caused: Hazardous Materials

The Cal OES Warning Center reports 89 hazardous materials incidents in the City of Atascadero from 1994 through October 24, 2018; as noted in subsection 5.3.16 of the County plan, this likely excludes a large number of unreported minor spills. This constitutes 5% of the hazardous materials incidents reported countywide during the same time frame and averages out to roughly 3.6 incidents per year. As noted in subsection 5.3.16, only around 6% of reported hazardous materials incidents result in injuries, fatalities, or evacuations.

B.4 Capability Assessment

Capabilities are the programs and policies currently in use to reduce hazard impacts or that could be used to implement hazard mitigation activities. This capabilities assessment is divided into five sections: regulatory mitigation capabilities, administrative and technical mitigation capabilities, fiscal mitigation capabilities, mitigation outreach and partnerships, and other mitigation efforts.

To develop this capability assessment, the jurisdictional planning representatives used a matrix of common mitigation activities to inventory which of these policies or programs were in place. The team then supplemented this inventory by reviewing additional existing policies, regulations, plans, and programs to determine if they contributed to reducing hazard-related losses.

During the plan update process, this inventory was reviewed by the jurisdictional planning representatives and Wood consultant team staff to update information where applicable and note ways in which these capabilities have improved or expanded. Additionally, in summarizing current capabilities and identifying gaps, the jurisdictional planning representatives also considered their ability to expand or improve upon existing policies



and programs as potential new mitigation strategies. The City of Atascadero's capabilities are summarized below.

B.4.1 Regulatory Mitigation Capabilities

Table B.20 City of Atascadero Regulatory Mitigation Capabilities

Regulatory Tool	Yes/No	Comments
General plan	Yes	General Plan 2025 Safety Element Establishes policies, programs, goals and objectives to protect the community from risks associated with seismic, geologic, flood, and fire hazards. The plan was originally adopted in June 2002 and most recently updated in July 2016.
Zoning ordinance	Yes	Title 9 Planning and Zoning
Subdivision ordinance	Yes	Title 11 Subdivisions
Growth management ordinance	No	
Floodplain ordinance	Yes	
Other special purpose ordinance (stormwater, water conservation, wildfire)	Yes	Title 7 Public Works, Chapter 11 Flood Damage Prevention. Addresses NFIP requirements, including methods and provisions for protecting structures against flood damage at the time of initial construction; controlling the alterations of natural floodplains and filling, grading, dredging, and other development that may increase flood damage; and preventing or regulating the construction of flood barriers that will unnaturally divert floodwaters or may increase flood hazards in other areas.
Building code	Yes	Title 8 Uniform Building Code. Requires minimum standards for structural seismic resistance established primarily to reduce the risk of life loss or injury. Also requires site-specific stability studies for hillside development.
Fire department ISO rating		ISO Rating is a 3 / 3X
Erosion or sediment control program	Yes	Public Works manages the City's MS4 Permit
Stormwater management program	Yes	City Engineering Standard Specifications Section 5 and Regional Water Quality Control Board Resolution No. R-3-2013-0032 contains the regulatory criteria and mitigations applicable to new development and redevelopment
Site plan review requirements	Yes	All development plans are reviewed, at a minimum, through the City's permitting process.
Capital improvements plan	Yes	
Economic development plan	No	
Local emergency operations plan	Yes	Multi-Hazard Emergency Response Plan Basic Plan and Appendices A-F. Adopted in Fall 2003 and Summer 2004.
Other special plans	Yes	Fire Department Master Plan. Identifies areas of the City at higher risk for wildland fires.





Regulatory Tool	Yes/No	Comments
Flood Insurance Study or other engineering study for streams	Yes	The City Flood Damage Prevention Regulations and City Engineering Standard Specifications requires detailed hydrology and analysis of projects located within certain flood zones or where it may impact streams
Elevation certificates (for floodplain development)	Yes	FEMA Elevation Certificates are required for new structures and substantially remodeled structures within any Flood Zone A.

The City of Atascadero's Zoning Ordinance, 9-3.600, FH (Flood Hazard) Overlay Zone, identifies areas where terrain would present new developments and their users with potential flood hazards. In addition, Ordinance No. 193, An Ordinance Adding Chapter 5 to Article 7 of the City of Atascadero Municipal Code Relating to Flood Damage Prevention, provides further guidance to reduce flood damage. It is the purpose of this ordinance to promote the public health, safety, and general welfare and to minimize public and private losses due to flood conditions. Also, Ordinance No. 304 amended Title 6, Chapter 13 of the Atascadero Municipal Code to provide a mechanism to allow the Fire Chief to order the removal of weeds, rubbish, and similar material that has the potential to become a flooding hazard.

B.4.2 Administrative/Technical Mitigation Capabilities

Table B.21 identifies the personnel responsible for activities related to mitigation and loss prevention in Atascadero.

Table B.21 City of Atascadero Administrative/Technical Mitigation Capabilities

Personnel Resources	Yes/No	Department/Position
Planner/engineer with knowledge of land development/land management practices	Yes	Community Development, Public Works
Engineer/professional trained in construction practices related to buildings and/or infrastructure	Yes	Community Development, Public Works
Planner/engineer/scientist with an understanding of natural hazards	Yes	Community Development, Public Works, Fire Department
Personnel skilled in GIS	Yes	Information Technology
Full time building official	Yes	Community Development
Floodplain manager	Yes	Public Works
Emergency manager	Yes	City Manager, alt. Police Chief and Fire Chief
Grant writer	Yes	Administrative Services
GIS Data Resources (Hazard areas, critical facilities, land use, building footprints, etc.)	Yes	Information Technology

B.4.3 Fiscal Mitigation Capabilities

Table B.22 identifies financial tools or resources that the City could potentially use to help fund mitigation activities.

Table B.22 City of Atascadero Fiscal Mitigation Capabilities

Financial Resources	Accessible/Eligible to Use (Yes/No)	Comments
---------------------	-------------------------------------	----------



Community Development Block Grants	Yes	
Capital improvements project funding	No	
Authority to levy taxes for specific purposes	Yes	Can be used for any hazard mitigation activity; however, it is only eligible for use with voter approval.
Fees for water, sewer, gas, or electric services	No	
Impact fees for new development	Yes	Can be used for both on-site and off-site capital improvements, including seismic hazard repair and maintenance, drainage, and critical facilities.
Incur debt through general obligation bonds	Yes	Can be used for any hazard mitigation activity; however, it is only eligible for use with voter approval.
Incur debt through special tax bonds	Yes	Can be used for any hazard mitigation activity; however, it is only eligible for use with voter approval.
Incur debt through private activities	Yes	Can be used for any hazard mitigation activity; however, it is only eligible for use with voter approval.
Withhold spending in hazard prone areas	No	

B.4.4 Mitigation Outreach and Partnerships

The City has an active wildfire fuel reduction and education program.

B.4.5 Opportunities for Enhancement

Based on the capabilities assessment, the City of Atascadero has several existing mechanisms in place that already help to mitigate hazards. In addition to these existing capabilities, there are also opportunities for the City to expand or improve on these policies and programs to further protect the community. Future improvements may include providing training for staff members related to hazards or hazard mitigation grant funding in partnership with the County and Cal OES. Additional training opportunities will help to inform City staff members on how best to integrate hazard information and mitigation projects into their departments. Continuing to train City staff on mitigation and the hazards that pose a risk to the City of Atascadero will lead to more informed staff members who can better communicate this information to the public.

B.5 Mitigation Strategy

B.5.1 Mitigation Goals and Objectives

The City of Atascadero Planning Team determined the eight goals from the 2014 HMP continue to be appropriate for this plan update. The following are the City of Atascadero 's 2019 mitigation goals and objectives:

Goal 1 – Increase public awareness of current Drought Conditions.

Objective 1 – Promote water conservation.

Objective 2 – Collaborate with the Atascadero Mutual Water Company to develop alternate water supplies via a pipeline from the Nacimiento Reservoir to achieve the maximum water allocation.





Goal 2 – Minimize the loss of property and life as the result of a Windstorm.

Objective 1 – Educate the public as to the effects of a Windstorm.

Goals 3 – Reduce the possibility of damage and losses due to Dam failure.

Objective 1 – Review and identify inundation areas due to dam failure.

Goals 4 – Reduce the possibility of damage and losses due to earthquakes.

Objective 1 – Continue to protect existing assets, as well as any future development, from the effects of earthquakes.

Goal 5 – Minimize property damage as a result of expansive unstable soil conditions.

Objective 1 – Protect future development from the effects of expansive unstable soil conditions.

Goal 6 – Reduce the possibility of damage and losses due to floods.

Objective 1 – Protect new development from floods.

Goal 7 – Reduce the possibility of damage and losses due to Land Subsidence.

Objective 1 – Protect existing assets, as well as new development, from Land Subsidence.

Goal 8 – Reduce the possibility of damage and losses due to wildland fires.

Objective 1 – Maintain and broaden current Wildland Fire protection.

Continued Compliance with the National Flood Insurance Program

The City has been an NFIP participating community since 1982. In addition to the mitigation actions identified herein the City will continue to comply with the NFIP. This includes ongoing activities such as enforcing local floodplain development regulations, including issuing permits for appropriate development in Special Flood Hazard Areas and ensuring that development is mitigated in accordance with the regulations. This will also include periodic reviews of the floodplain ordinance to ensure that it is clear, up to date, and in compliance with the Federal model ordinance (Flood Damage Prevention Regulations).

B.5.2 Completed 2015 Mitigation Actions

During the 2019 planning process the City of Atascadero Grande Planning reviewed all the mitigation actions from the 2015 plan. During the 2019 planning process the Planning Team identified that all of their fourteen (14) mitigation actions from 2015 are ongoing or implemented annually, demonstrating ongoing progress and an effort to build the community's resiliency to disasters. Table B.23 below describes the City of Atascadero 2020 Mitigation Strategy.

B.5.3 Mitigation Actions

The planning team for the City of Atascadero identified and prioritized the following mitigation actions based on the risk assessment. Background information and information on how each action will be implemented and administered, such as ideas for implementation, responsible office, potential funding, estimated cost, and timeline are also included. Actions were prioritized using the process described in subsection 7.2.1 of the Base Plan. Actions with an '*' are those that mitigate losses to future development.




Table B.23 City of Atascadero's Mitigation Action Plan

ID	Hazard(s) Mitigated	Description/Background/Benefits	Lead Agency and Partners	Cost Estimate	Potential Funding	Priority	Timeline	Status/ Implementation Notes
AT.1	Dam Failure	Prepare an inundation map and emergency action plan for a dam failure at Atascadero Lake. Benefits: Reduce or eliminate damages and impacts to 100+ homes and city infrastructure due to potential failure	City of Atascadero Public Works	Less than \$10,000	FEMA HMA	Medium / Low	2-3 yrs.	New
AT.2	Dam Failure	Minimize development along the Salinas River. Maintain setback and open space ordinances along the River and continue the enforcement of existing land use ordinances	Community Development / Public Works	Little to no cost	Staff Time/Dept. Budget	Medium	Annual	Annual Implementation
AT.3	Wildfire	Wildfire Evacuation Routes. Seek options to improve city road systems to become compliant with Public Resource Code 4290, designed to improve emergency access and egress and emergency evacuation times. Benefits: Improved road widths and clearance; enhanced residence evacuation times in high fire severity zones; elimination or reductions in loss of life	Atascadero Fire & Emergency Services	\$500,000 to \$1,000,000	FEMA HMA	High	More than 5 yrs.	New
AT.4	Wildfire	Continue to educate public on wildland fire safety	Fire Dept.	Little to no cost	CA Fire Safe Council, General Fund, FEMA HMA	High	Ongoing	In Progress
AT.5	Wildfire	Continue the enforcement on the Weed Abatement Ordinance	Fire Dept.	Little to no cost	CA Fire Safe Council, General Fund, FEMA HMA	High	Ongoing	In Progress
AT.6	Wildfire	Maintain and revise the CWPP	Fire Dept.	Little to no cost	CA Fire Safe Council, General Fund, FEMA HMA	High	Ongoing	In Progress



ID	Hazard(s) Mitigated	Description/Background/Benefits	Lead Agency and Partners	Cost Estimate	Potential Funding	Priority	Timeline	Status/ Implementation Notes
AT.7	Wildfire	Research emerging fuels management programs and implement where appropriate	Fire Dept.	Little to no cost	CA Fire Safe Council, General Fund, FEMA HMA	High	Ongoing	In Progress
AT.8	Wildfire	Continue fuel load reductions program by annual control burns in the WUI impacting the city	Fire Dept.	Little to no cost	CA Fire Safe Council, General Fund, FEMA HMA	High	Ongoing	In Progress
AT.9	Adverse Weather – Wind	Debris Management Plan Development. Develop a debris management plan to handle slash and leaf accumulation produced by a wind or storm event. Benefits: Reduced impacts due to debris accumulation	Public Works; Fire and Emergency Services	\$10,000 to \$50,000	FEMA HMA	High	3-5 yrs.	New
AT.10	Adverse Weather - Wind	Plan Around Forced Blackouts. Pacific Gas and Electric is implementing a forced power blackout during anticipated or actual wind events which may impact citizens at risk and residential care facilities; identify target hazards and at-risk populations in the event of a forced blackout. Benefits: Reduced impacts to at-risk populations from rolling blackouts	Public Works; Fire and Emergency Services	Little to no cost	Staff Time/Dept. Budget	High	1 yr.	New
AT.11	Earthquake	Continue to enforce Uniform Building Code (UBC) provisions pertaining to grading and construction relative to seismic hazards.	Community Development / Public Works	Little to no cost	General Fund/Staff Time/Dept. Budget	High	Ongoing	In Progress
AT.12	Earthquake	Continue to implement an Unreinforced Masonry (URM) building program that determines the structural safety of City owned critical facilities, and retrofit as necessary	Community Development / Public Works	Little to no cost	General Fund/Staff Time/Dept. Budget	High	Ongoing	In Progress
AT.13 *	Expansive Soils	Continue to require a Soils Report for all new building permits	Community Development	Little to no cost	General Fund/Staff	Medium	Ongoing	In Progress. Required for all





ID	Hazard(s) Mitigated	Description/Background/Benefits	Lead Agency and Partners	Cost Estimate	Potential Funding	Priority	Timeline	Status/ Implementation Notes
					Time/Dept. Budget			buildings over 1000 square feet
AT.14 *	Flood	During the plan check process utilize GIS to ensure the building project meets current Flood Damage Prevention Regulations prior to the issuance of building permits	Community Development / Public Works	Little to no cost	General Fund/Staff Time/Dept. Budget	High	Ongoing	In Progress
AT.15	Landslide	Require construction and maintenance of natural and/or human-made retaining structures that will help control subsidence risk in key residential and/or commercial areas	Community Development / Public Works	Little to no cost	General Fund/Staff Time/Dept. Budget	Medium	Ongoing	In Progress
AT.16	Landslide	Retrofit or implement stabilizing measures for Atascadero hillside developments that predate current best practices and codes	Community Development / Public Works	Little to no cost	General Fund/Staff Time/Dept. Budget	Medium	Ongoing	In Progress
AT.17	Landslide	Located and identify unstable soils through the use of GIS and soil maps	Community Development / Public Works	Little to no cost	General Fund/Staff Time/Dept. Budget	Medium	Ongoing	In Progress
AT.18 *	Landslide	Focus on proposed new developments to determine if soils stabilization is economically feasible. If the soils stabilization is not economically feasible deny, the proposed development or rezone	Community Development / Public Works	Little to no cost	General Fund/Staff Time/Dept. Budget	Medium	Ongoing	In Progress
AT.19	Drought and Water Shortage	Implement the water demand management strategies outlined in the Atascadero Mutual Water Company Urban Water Management Plan	Community Development / Public Works/ Atascadero Mutual Water Company	Variable	General Fund/Staff Time/Dept. Budget	Medium	3-5 yrs.	New





B.6 Implementation and Maintenance

Moving forward, the City will use the mitigation action table in the previous section to track progress on implementation of each project. As illustrated in subsection 7.3.1 of the County plan, much progress has been made since the plan was originally developed. Implementation of the plan overall is discussed in Section 8 of the main plan.

B.6.1 Incorporation into Existing Planning Mechanisms

The information contained within this plan, including results from the Vulnerability Assessment, and the Mitigation Strategy will be used by the City to help inform updates and the development of local plans, programs and policies. The Engineering Division may utilize the hazard information when implementing the City's Community Investment Program and the Planning and Building Divisions may utilize the hazard information when reviewing a site plan or other type of development applications. The City will also incorporate this LHMP into the Safety Element of their General Plan, as recommended by Assembly Bill (AB) 2140.

As noted in Section 7 Plan Implementation, the HMPC representatives from Atascadero will report on efforts to integrate the hazard mitigation plan into local plans, programs and policies and will report on these efforts at the annual HMPC plan review meeting.

B.6.2 Monitoring, Evaluation and Updating the Plan

The City will follow the procedures to monitor, review, and update this plan in accordance with San Luis Obispo County as outlined in Section 8 of the Base Plan. The City will continue to involve the public in mitigation, as described in subsection 8.3 of the Base Plan. The Fire Chief will be responsible for representing the City in the County HMPC, and for coordination with City staff and departments during plan updates. The City realizes it is important to review the plan regularly and update it every five years in accordance with the Disaster Mitigation Act Requirements as well as other State of California requirements.





C.1 Community Profile

C.1.1 Mitigation Planning History and 2019 Process

This annex was created during the development of the 2019 San Luis Obispo County Hazard Mitigation Plan update. This Jurisdictional Annex builds upon the previous version of the Multi-Jurisdictional Local Hazard Mitigation Plan for the cities of Grover Beach, Arroyo Grande as well as the Lucia Mar Unified School District and South San Luis Obispo County Sanitation District completed in December 2014 and approved by FEMA in December 2015; that previous mitigation plan was not incorporated into the City's General Plan, as this updated mitigation plan will be. The City has used the previous mitigation plan as a basis for the Emergency Operations Plan. A review of jurisdictional priorities found no significant changes in priorities since the last update.

The City's Local Planning Team (LPT) held responsibility for implementation and maintenance of the plan; members are noted below. The Police Chief for Grover Beach Police is responsible for updating the plan.

Table C.1 Grover Beach Hazard Mitigation Plan Revision Planning Group

Department or Stakeholder	Title
Police Department	Chief of Police
Public Works	Public Works Director / City Engineer
Community Development	Community Development Director

More details on the planning process followed and how the jurisdictions, service districts and stakeholders participated can be found in Section 3 of the Base Plan, as well as how the public was involved during the 2019 update.

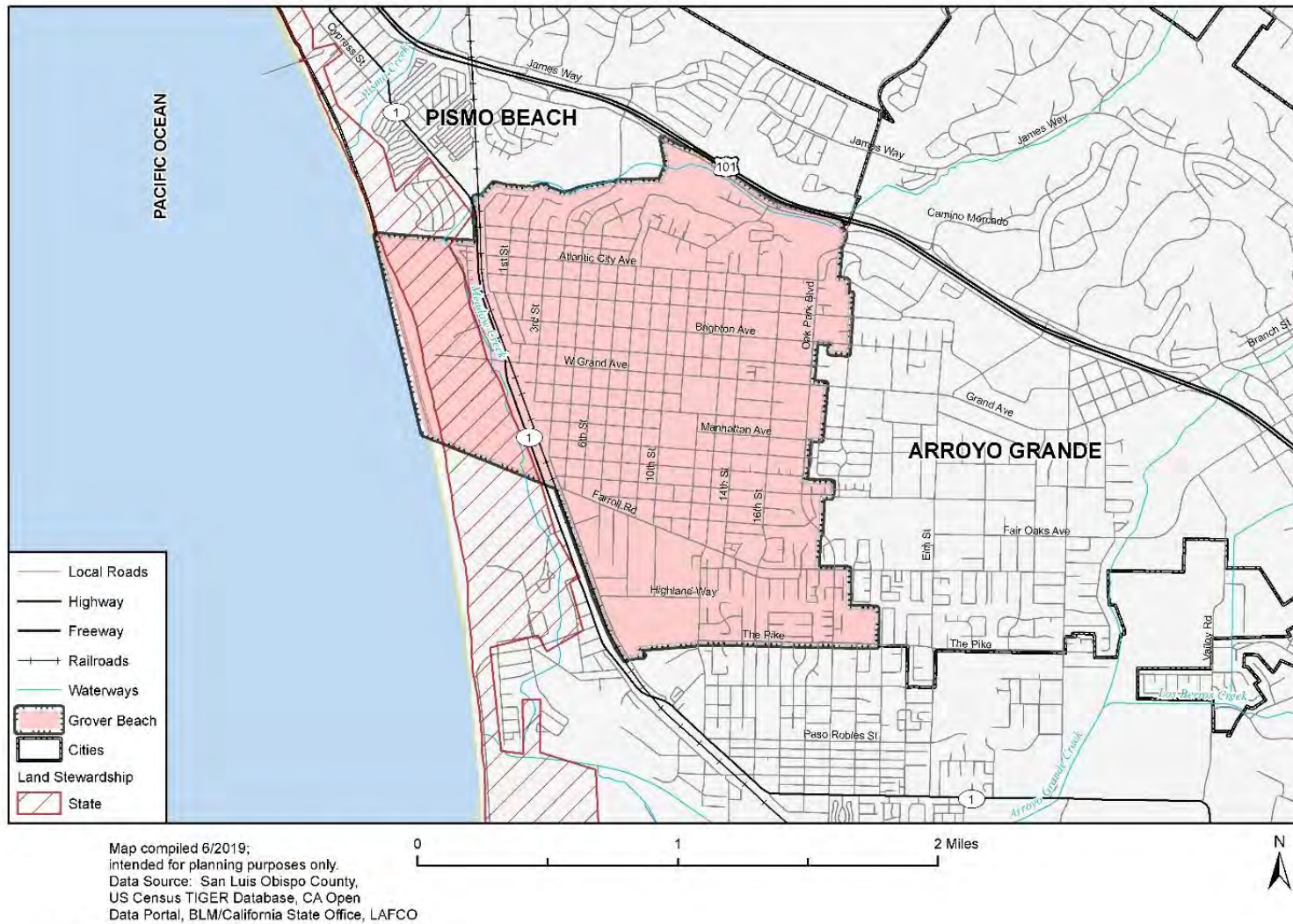
C.1.2 Geography and Climate

The City of Grover Beach is a coastal community located in the south county area of San Luis Obispo County. Grover Beach has wide sandy beaches with coastal dunes and is a gateway to Pismo State Beach and Oceano Dunes State Vehicular Recreational Area. According to the City's 2015 LHMP, Grover Beach has an average high temperature (July) of 70°F and low temperature of 62°F (January). The jurisdiction receives 17.1 inches of rainfall in an average year. While the average temperature is relatively temperate, summer and winter months bring unique weather patterns to the region. Figure C.1 displays a map and the location within San Luis Obispo County of the City of Grover Beach planning area.





Figure C.1 The City of Grover Beach





C.1.3 History

On August 1, 1887 Dwight William Grover founded the Town of Grover after purchasing the land for \$22,982.20 in gold from John Michael Price, the founder of Pismo Beach. Grover promoted his town as “the place where the tide lands and the rails meet” and had a vision of a community that had a hotel and a train station near the beach. Grover and his partner George Gates laid out a street grid pattern and promoted the community as Grover City, the “grandest summer and winter seaside resort on the Pacific Coast.”

Development didn’t flourish in Grover City until 1935 when Horace V. Bagwell bought 1,100 acres and advertised Grover City as the “home of the average man” with land prices affordable to the working man. People and development began to happen and by the mid-1940’s the first store opened in Grover City followed by the first post office. The Fair Oaks Fire District and the Grover City Water District were formed in 1949 and supported a boom in population throughout the 1950’s. On December 21, 1959 the people of Grover City voted to incorporate and become the City of Grover City. In 1992, the City had become more established and the residents of Grover City decided to rename the community to “Grover Beach”. By 1996 the train station Dwight William Grover dreamed of became a reality when Amtrak began rail service at a newly constructed Grover Beach Train Station.

C.1.4 Economy

Select estimates of economic characteristics for the City of Grover Beach are shown in Table C.2.

Table C.2 City of Grover Beach Economic Characteristics, 2013-2017

Characteristic	City of Grover Beach
Families below Poverty Level (%)	10%
All People below Poverty Level (%)	14%
Median Family Income	\$65,250
Median Household Income	\$61,482
Per Capita Income	\$30,873
Population in Labor Force	6,613
Population Employed*	6,260
Unemployment	309

Source: CA Department of Finance U.S. Census Bureau American Community Survey 2013-2017 5-Year Estimates, www.census.gov/

*Excludes armed forces

Table C.3 show how the City of Grover Beach’s labor force breaks down by industry based on estimates from the 2013-2017 five-year American Community Survey.



**Table C.3 City of Grover Beach's Employment by Industry, 2013-2017**

Industry	# Employed	% Employed
Educational Services, and Health Care and Social Assistance	1,640	26%
Retail Trade	572	9%
Professional, Scientific, and Mgmt., and Administrative and Waste Mgmt. Services	789	13%
Manufacturing	245	4%
Arts, Entertainment, and Recreation, and Accommodation, and Food Services	786	13%
Construction	520	8%
Finance and Insurance, and Real Estate and Rental and Leasing	286	5%
Public Administration	251	4%
Other Services, Except Public Administration	240	4%
Wholesale Trade	234	4%
Transportation and Warehousing, and Utilities	439	7%
Agriculture, Forestry, Fishing and Hunting, and Mining	57	1%
Information	192	3%
Total	6,251	26%

Source: U.S. Census Bureau American Community Survey 2013-2017 5-Year Estimates, www.census.gov/

C.1.5 Population

According to data extracted by the California Department of Finance from U.S. Census Bureau's American Community Survey 5-Year Estimates (2013-2017), the total population for the City of Grover Beach was estimated at 13,524 persons. Select demographic and social characteristics for the City of Grover Beach from the 2013-2017 American Community Survey are shown in Table C.4.



**Table C.4 City of Grover Beach's Demographic and Social Characteristics, 2013-2015**

Characteristic	City of Grover Beach
Gender/Age	
Male	6,687
Female	6,837
Median age (years)	36
Under 5 years	1,236
Under 18 years	3,435
65 years and over	1,875
Race/Ethnicity	
White	7,952
Asian	393
Black or African American	316
American Indian/Alaska Native	101
Hispanic or Latino (of any race)	4,279
Native Hawaiian and Other Pacific Islander	126
Education	
% High school graduate or higher	85%
Disability Status	
% of Population 5 years and over with a disability	15%

Source: CA Department of Finance, U.S. Census Bureau American Community Survey 2013-2017 5-Year Estimates, www.census.gov/

C.1.6 Development Trends

The City's General Plan Land Use Element (2010) recognizes that a majority of the City has been developed and future development will be concentrated on vacant properties and redevelopment of underutilized properties. The following figures from the San Luis Obispo County Council of Governments (COG), 2050 Regional Growth Forecast for San Luis Obispo County show the projected population and housing unit growth between 2010 and 2050. According to the COG's document the City's population is projected to increase to over 15,000 residents by 2050.



**Figure C.2 City of Grover Beach Population Projections, 2010 to 2050**

Jurisdiction	2010	2015	2020	2025	2030	2035	2040	2045	2050
Arroyo Grande	17,252	17,678	18,288	18,956	19,505	19,930	20,158	20,293	20,449
Atascadero	28,310	30,401	31,384	32,240	33,043	33,703	34,063	34,278	34,538
Grover Beach	13,156	13,340	13,751	14,183	14,536	14,804	14,934	15,001	15,091
Morro Bay	10,234	10,640	11,025	11,401	11,715	11,961	12,092	12,169	12,261
Paso Robles	29,793	31,348	32,755	34,314	35,582	36,561	37,130	37,487	37,858
Pismo Beach	7,655	8,068	8,642	9,122	9,486	9,753	9,901	9,989	10,079
San Luis Obispo	45,119	45,950	47,214	48,601	49,759	50,659	51,105	51,347	51,672
Incorporated Cities	151,519	157,425	163,059	168,817	173,626	177,371	179,383	180,564	181,948
Unincorporated Area	118,118	118,950	123,597	128,279	132,066	134,975	136,539	137,461	138,534
Regional Total:	269,637	276,375	286,657	297,095	305,692	312,346	315,922	318,025	320,482

Source: U.S. Census Bureau (2010 Census), State of California, Department of Finance (2015),
Beacon Economics (forecast years)

Source: 2050 Regional Growth Forecast for San Luis Obispo County, San Luis Obispo Council of Governments and Beacon Economics, June 2017

Figure C.3 City of Grover Beach Housing Unit Projections, 2010 to 2050

Jurisdiction	2010	2015	2020	2025	2030	2035	2040	2045	2050
Arroyo Grande	7,628	7,740	8,228	8,541	8,767	8,949	9,054	9,122	9,186
Atascadero	11,505	11,875	12,845	13,553	14,077	14,501	14,767	14,995	15,120
Grover Beach	5,748	5,770	6,102	6,274	6,409	6,531	6,610	6,670	6,728
Morro Bay	6,320	6,378	6,785	7,010	7,190	7,325	7,384	7,409	7,433
Paso Robles	11,426	11,706	12,343	12,949	13,452	13,843	14,071	14,215	14,342
Pismo Beach	5,585	5,649	6,089	6,227	6,364	6,517	6,629	6,707	6,768
San Luis Obispo	20,553	20,887	21,786	22,165	22,388	22,534	22,655	22,658	22,816
Incorporated Cities	68,765	70,005	74,178	76,719	78,646	80,200	81,170	81,775	82,395
Unincorporated Area	48,550	49,692	50,672	52,449	53,814	54,929	55,486	55,888	56,244
Regional Total:	117,315	119,697	124,850	129,168	132,460	135,129	136,657	137,664	138,640

Source: U.S. Census Bureau (2010 Census), State of California, Department of Finance (2015),
Beacon Economics (forecast years)

Source: 2050 Regional Growth Forecast for San Luis Obispo County, San Luis Obispo Council of Governments and Beacon Economics, June 2017

The California Department of Finance State Demographic Report released on May 1, 2019 indicated the current population of 13,533 and between January 1, 2018 and 2019 the City of Grover Beach lost 0.6 percent of its population. Statewide, California's 2018 population growth rate (0.47%) was the slowest in the State's history.

C.2 Hazard Identification and Summary

The Grover Beach Planning Team identified the hazards that affect the City and summarized their frequency of occurrence, spatial extent, potential magnitude, and significance specific to Grover Beach (see Table C.5). There are no hazards that are unique to Grover Beach. The overall hazard significance takes into account the geographic area, probability and magnitude as a way to identify priority hazards for mitigation purposes. This is discussed further in the Vulnerability Assessment Section.


Table C.5 City of Grover Beach – Hazard Summaries

Hazard	Geographic Area	Probability of Future Occurrence	Magnitude/Severity (Extent)	Overall Significance
Coastal Storm/Coastal Erosion/Sea Level Rise	Limited	Occasional	Limited	Low
Dam Incidents	Significant	Unlikely	Limited	Low
Drought and Water Shortage	Extensive	Likely	Limited	High
Earthquake	Extensive	Occasional	Critical	High
Flood	Limited	Occasional	Limited	Low
Tsunami and Seiche	Limited	Occasional	Limited	Low
Wildfire	Limited	Occasional	Limited	Low
Human Caused: Hazardous Materials	Limited	Occasional	Negligible	Low
Geographic Area Limited: Less than 10% of planning area Significant: 10-50% of planning area Extensive: 50-100% of planning area Probability of Future Occurrences Highly Likely: Near 100% chance of occurrence in next year or happens every year. Likely: Between 10 and 100% chance of occurrence in next year or has a recurrence interval of 10 years or less. Occasional: Between 1 and 10% chance of occurrence in the next year or has a recurrence interval of 11 to 100 years. Unlikely: Less than 1% chance of occurrence in next 100 years or has a recurrence interval of greater than every 100 years.		Magnitude/Severity (Extent) Catastrophic—More than 50 percent of property severely damaged; shutdown of facilities for more than 30 days; and/or multiple deaths Critical—25-50 percent of property severely damaged; shutdown of facilities for at least two weeks; and/or injuries and/or illnesses result in permanent disability Limited—10-25 percent of property severely damaged; shutdown of facilities for more than a week; and/or injuries/illnesses treatable do not result in permanent disability Negligible—Less than 10 percent of property severely damaged, shutdown of facilities and services for less than 24 hours; and/or injuries/illnesses treatable with first aid Significance Low: minimal potential impact Medium: moderate potential impact High: widespread potential impact		





C.3 Vulnerability Assessment

The intent of this section is to assess Grover Beach's vulnerability separate from that of the County as a whole, which has already been assessed in subsection 5.3 Risk Assessment in the Base Plan. This vulnerability assessment analyzes the population, property, and other assets at risk to hazards ranked of medium or high significance that may vary from other parts of the planning area.

The information to support the hazard identification and risk assessment was based on the previous LHMP for the City. A Local Hazard Mitigation Plan Update Guide and associated worksheets was distributed to each participating municipality or special district to complete during the 2019 update process. Information collected was analyzed and summarized in order to identify and rank all the hazards that could impact anywhere within the County, as well as to rank the hazards and identify the related vulnerabilities unique to each jurisdiction.

Each participating jurisdiction was in support of the main hazard summary identified in the Base Plan (See Table 5.2). However, the hazard summary rankings for each jurisdictional annex may vary slightly due to specific hazard risk and vulnerabilities unique to that jurisdiction. Identifying these differences helps the reader to differentiate the jurisdiction's risk and vulnerabilities from that of the overall County.

Note: The hazard "Significance" reflects overall ranking for each hazard and is based on the City of Grover Beach's Planning Team member input from the Data Collection Guide and the risk assessment developed during the planning process (see Section 5 of the Base Plan), which included a more detailed qualitative analysis with best available data.

The hazard summaries in Table C.5 reflect the hazards that could potentially affect the City. The discussion of vulnerability for each of the following hazards is located in C.3.2 Estimating Potential Losses. Based on this analysis, the priority hazard (High Significance) for mitigation is earthquake. Those of Medium or High significance for the City of Grover Beach are identified below.

- Drought and Water Shortage
- Earthquake

Other Hazards

Hazards assigned a significance rating of Low or which do not differ significantly from the County ranking (e.g., Low vs. High) are not addressed further in this plan and are not assessed individually for specific vulnerabilities in this section. Those hazards include agricultural hazards, biological agents, adverse weather hazards, wildfires, and landslides.

C.3.1 Assets at Risk

This section considers Grover Beach's assets at risk, including values at risk, critical facilities and infrastructure, historic assets, economic assets, and growth and development trends.

Values at Risk

The following data on property exposure is derived from the San Luis Obispo County 2019 Parcel and Assessor data. This data should only be used as a guideline to overall values in the City as the information has some limitations. The most significant limitation is created by Proposition 13. Instead of adjusting property values annually, the values are not adjusted or assessed at fair market value until a property transfer occurs. As a result, overall value information is likely low and does not reflect current market value of properties. It is also important to note that in the event of a disaster, it is generally the value of the infrastructure or improvements to the land





that is of concern or at risk. Generally, the land itself is not a loss. Table C.6 shows the exposure of properties (e.g., the values at risk) broken down by property type for the City of Grover Beach.

Table C.6 2019 Property Exposure for the City of Grover Beach by Property Types

Property Type	Parcel Count	Improved Value	Content Value	Total Value
Agricultural	1	\$3,139	\$3,139	\$6,278
Commercial	242	\$71,707,475	\$71,707,475	\$143,414,950
Government/Utilities	37	\$21,533	--	\$21,533
Other/Exempt/Misc.	135	\$31,280,820	--	\$31,280,820
Residential	3,054	\$506,840,814	\$253,420,407	\$760,261,221
Multi-Family Residential	600	\$135,833,108	\$67,916,554	\$203,749,662
Mobile/Manufactured Homes	39	\$2,752,757	\$1,376,379	\$4,129,136
Residential: Other	550	\$102,234,078	\$51,117,039	\$153,351,117
Industrial	27	\$11,177,087	\$16,765,631	\$27,942,718
Vacant	28	\$4,325,265	--	\$4,325,265
Total	4,713	\$866,176,076	\$462,306,623	\$1,328,482,699

Source: Wood Plc analysis based on ParcelQuest and San Luis Obispo County Assessor's Office data 2019

Critical Facilities and Infrastructure

A critical facility may be defined as one that is essential in providing utility or direction either during the response to an emergency or during the recovery operation. See Section 5 of the Base Plan for more details on the definitions and categories of critical facilities.

An inventory of critical facilities in the City of Grover Beach from San Luis Obispo County GIS is provided in Table C.7 and illustrated in Figure C.4. A more detailed list of the critical facilities, their location square footage and values from the City's 2015 HMP can be found as an attachment to this Annex.

Table C.7 City of Grover Beach's Critical Facilities

Facility Type	Counts
Multi-modal Center (Amtrak Station)	1
Community Centers (evacuation centers including City Hall)	3
Fire Stations	1
Local Law Enforcement	1
Private Schools	1
Public Schools	3
Emergency Communications Facility	1
Sewer Lift Stations	3
Storm Basin Pump Station	1
Water Booster Pumps	1
Water Reservoirs	3
Water Wells & Treatment Facilities	4
Total	23

Source: San Luis Obispo County Planning & Building, HIFLD 2017





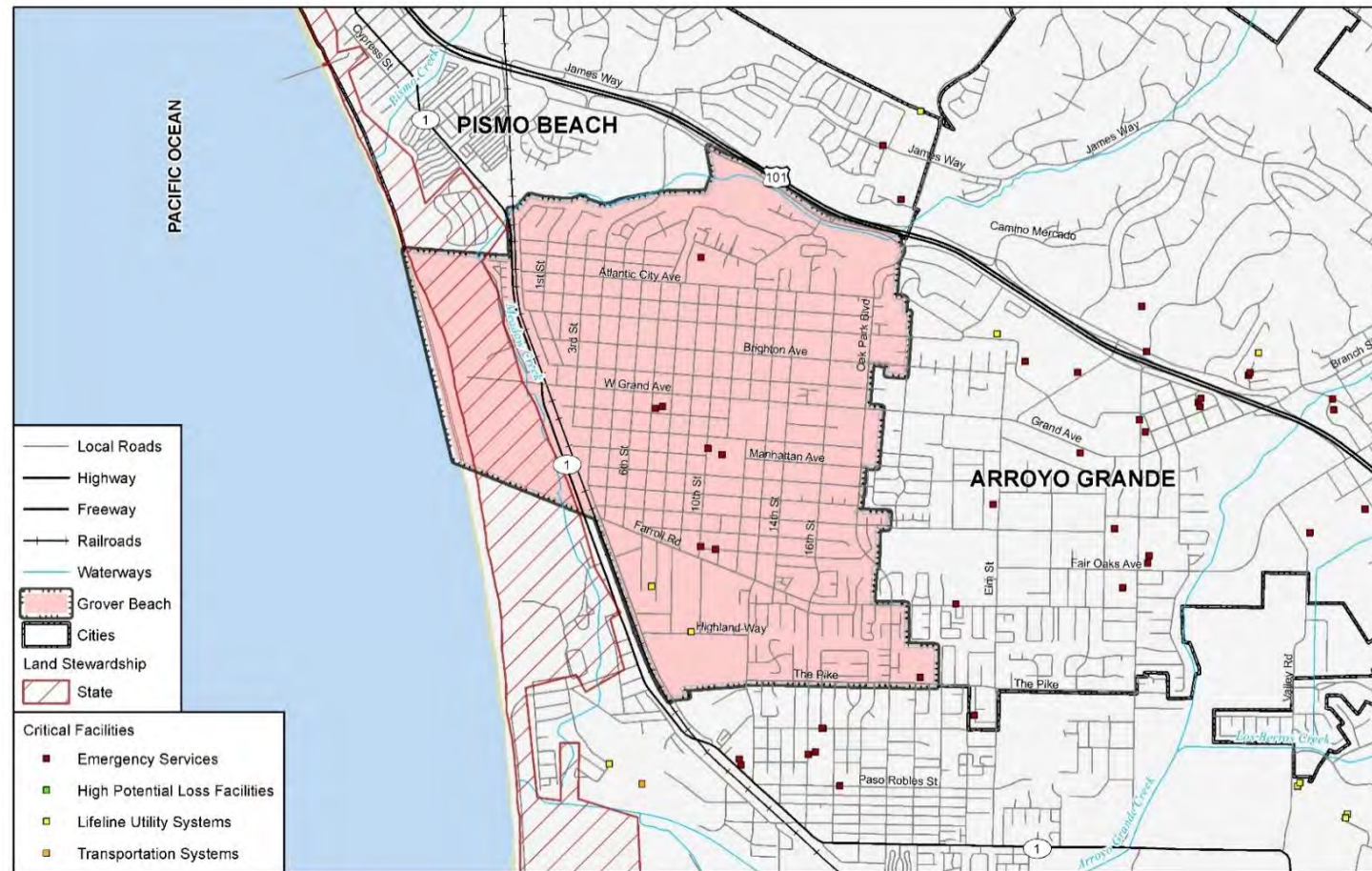
Transportation and Lifeline Facilities

State Route 1 and U.S. Highway 101 border the City of Grover Beach on the west and the northeast of the City limits. Route 1 serves as a two-lane arterial for the City and merges with Highway 101 north of the City. In addition to these major transportation routes adjacent to Grover Beach, the City also offers multi-modal transportation options for residents including bike lanes, bus routes and the Grover Beach Train Station. According to the City's 2015 LHMP the Grover Beach Train Station is listed as being vulnerable to earthquakes, flooding, wildfire and tsunami hazards. Other vulnerable City owned transportation and lifeline facilities were noted in the 2015 plan with a combined value of nearly \$50 million. The complete list of vulnerable transportation and lifeline facilities can be found in an attachment to this Annex.





Figure C.4 City of Grover Beach Critical Facilities



Map compiled 6/2019;
intended for planning purposes only.
Data Source: San Luis Obispo County,
US Census TIGER Database, CA Open
Data Portal, BLM/California State Office,
LAFCO, HIFLD

0 1 2 Miles





Historic and Cultural Resources

While the City of Grover Beach has no registered state or federal historic sites, there are several assets within Grover Beach that define the community and represent the City's history. Many of the historical sites of importance to Grover Beach have been converted into different uses but the historic buildings still stand. In honor of the City's 50th Anniversary a self-guided tour pamphlet was created and lists the following historic sites.

- Grover Beach City Hall – 154 South 8th Street
- Precision Automotive (now Grover Beach Fire Station) – 701 Rockaway Avenue
- Grover City Hall/Fire Department (now Exploration Station) – 967 Ramona Avenue
- Grover City Development (now Spoon Trade Restaurant) – 295 West Grand Avenue
- White's Malt Shop (now Enterprise Rental Car) – 502 West Grand Avenue
- The Keen Agency (now Taco De Mexico) – 791 West Grand Avenue
- Marshall – Spoo Sunset Funeral Chapel – 1239 Longbranch Avenue
- Yeackel's / Fairlane Department Store (now Ron's Nursery) – 850 West Grand Avenue
- Grover City Shoe – (now South County Sanitary) – 866 West Grand Avenue
- Greg's Restaurant (DarWish Cuisine) – 967 West Grand Avenue
- Grover City Pharmacy (now Green Bargain) – 901 West Grand Avenue
- First Southern Baptist Church (now Beacon Chiropractic) 902 West Grand Avenue
- Grover City Feed Store (now Ben's Computer Outlet) – 983 West Grande Avenue
- Blinking Owl (now Villa Del Mar) – 110 West Grand Avenue
- Pizza Fresh – 1301 West Grand Avenue;
- Mobile Station (now Nan's Bookstore) – 1328 West Grand Avenue
- Spears Residence (now Salon Dee) – 122 North 16th Street This is now Hogge Insurance Services
- A&W Root Beer (now Higher Grounds) – 1754 Grande Avenue this is now Crossroads Cafe

Source: City of Grover Beach Historic Self-Guided Tour <http://www.grover.org/DocumentCenter/Home/View/1455>

Natural Resources

Natural resources are important to include in benefit-cost analyses for future projects and may be used to leverage additional funding for projects that also contribute to community goals for protecting sensitive natural resources. The City of Grover Beach has designated areas on the coast as Coastal Open Space Zone; according to the City of Grover Beach Local Coastal Program (2014) this zone is designed to protect and preserve sensitive natural areas including but not limited to those containing significant habitat areas, rare or endangered plant and animal species, and erosion-prone lands. Awareness of natural assets and designated natural areas can lead to opportunities for meeting multiple objectives. For instance, protecting wetlands areas protects sensitive habitat as well as attenuates and stores floodwaters.

Economic Assets

Tourism and the industries that support tourists and tourism activities are one of the greatest economic assets in the City of Grover Beach. Additionally, the commercial cannabis industry has taken off and has become a critical economic asset for the City in terms of tax revenue. The City is located close to multiple destinations including Pismo State Beach, Oceano Dunes State Recreation Area, and the Guadalupe-Nipomo Dunes National Wildlife Refuge.

The HMPC reviewed the economic strengths and competitive advantages listed in the City of Grover Beach Final Economic Development Strategy (April 11, 2017), and identified the following:





- Grover Beach is one of the few areas within the Southern SLO County area that has undeveloped industrial land, however these properties are quickly transforming into developed industrial and commercial holdings.
- Growth in commercial cannabis. The commercial cannabis industry has played a major role in the last few years in redeveloping properties, as well as new industrial construction within the undeveloped industrial zone. The City will continue to be a future “synergy” location for commercial cannabis within San Luis Obispo County with testing labs, manufacturing, warehousing, and retail sales of commercial cannabis.
- Transient occupancy tax revenue recovered quickly following the Great Recession. The development of additional lodging facilities including the Grover Beach Lodge, the Northeast Grover Beach Mixed-Use Development, and 950 El Camino Real. Development of these hotels will provide Grover Beach with an opportunity to increase tourism to the community.
- Higher quality retail and food service establishments have entered the market and increased the City’s regional draw
- Grover Beach has a reputation as a business-friendly community with a local government that is fairly easy to work with, compared to other communities.

C.3.2 Estimating Potential Losses

Note: This section details vulnerability to specific hazards of high or medium significance, where quantifiable, and/or where (according to Planning Team member input) it differs from that of the overall County.

Table C.6 above shows Grover Beach’s exposure to hazards in terms of number and value of structures. San Luis Obispo County’s parcel and assessor data was used to calculate the improved value of parcels. The most vulnerable structures are those in the floodplain (especially those that have been flooded in the past), unreinforced masonry buildings, and buildings built prior to the introduction of modern-day building codes. Impacts of past events and vulnerability to specific hazards are further discussed below. (See subsection 5.1 for more detailed information about these hazards and their impacts on San Luis Obispo County as a whole.)

Dam Incidents

The Lopez Dam, a high hazard earthen dam located upstream from the community, poses the greatest risk to Grover Beach if an incident was to occur. Failure of the Lopez Dam would follow the Arroyo Grande Creek in a westerly direction approximately 3,000 feet in each direction of the centerline of the creek channel. A total of 5,319 persons and 2,392 properties would be inundated in the City of Grover Beach if the Lopez Dam was to fail. Note that the Lopez Dam inundation mapping used to arrive at this information came from the County of San Luis Obispo’s Planning & Building/GIS Departments.

A majority of properties at risk are residential (2,119 properties) and have a combined value of \$539,526,282 (refer to Table C.8 below). Refer to the Critical Facilities in the Lopez Dam Inundation Area, by Type of Facility table, in the Base Plan for details on the type of various types of critical facilities at risk. A failure of the Lopez Dam would also affect Highway 101 impeding or reducing flows of goods, people and resources into and out of Grover Beach and potentially impacting the entire region. There have been no past dam incidents or failures in the jurisdiction of the City of Grover Beach. Refer to the Dam Incidents Section in Section 5 of the Base Plan for additional discussion on the potential impacts of dam incidents in the County.

This information was derived from the most recent dam inundation mapping, parcel, and critical facility data available to the County of San Luis Obispo. The Grover Beach planning team added the following comments related to dam failure and inundation hazards:





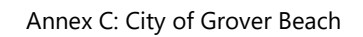
- Lopez Dam failure would result in overtopping of Arroyo Grande Creek which would cause a backwater condition in Meadow Creek, primarily along Highway 1 and the Union Pacific Railroad tracks.
- There are two facilities deemed critical to the City which are at risk from this flooding: The Train Station and the Front Street Sanitary Sewer Lift Station. However, neither of these was originally included in the countywide critical facility dataset and as such were not mapped or included in tables or summary results.
- Grover Beach would be surrounded by flood waters and Highway 101 would be impassible at Oak Park Boulevard if the Lopez Dam were to cause inundation downstream, which would limit ingress/egress to Highway 101 to the northwest and significantly restrict access by emergency services from outside the city.

Table C.8 Lopez Dam Inundation Estimate Losses by Property Type

Property Type	Parcel Count	Improved Value	Content Value	Total Value	Loss Estimate	Population
Agricultural	1	\$3,139	\$3,139	\$6,278	\$3,139	--
Commercial	120	\$24,487,269	\$24,487,269	\$48,974,538	\$24,487,269	--
Government/Utilities	29	--	--	\$0	\$0	--
Other/Exempt/Misc.	84	\$21,487,616	--	\$21,487,616	\$10,743,808	--
Residential	1,488	\$234,335,647	\$117,167,824	\$351,503,471	\$175,751,735	3,735
Multi-Family Residential	316	\$74,162,097	\$37,081,049	\$111,243,146	\$55,621,573	793
Mobile/Manufactured Homes	2	\$391,213	\$195,607	\$586,820	\$293,410	5
Residential: Other	313	\$50,795,230	\$25,397,615	\$76,192,845	\$38,096,423	786
Industrial	21	\$8,932,723	\$13,399,085	\$22,331,808	\$11,165,904	--
Vacant	18	\$2,764,023	--	\$2,764,023	\$1,382,012	--
TOTAL	2,392	\$417,358,957	\$217,731,586	\$635,090,543	\$317,545,272	5,319

Source: San Luis Obispo County Planning and Building Dept., Assessor's Office, ParcelQuest, Wood Plc Parcel Analysis



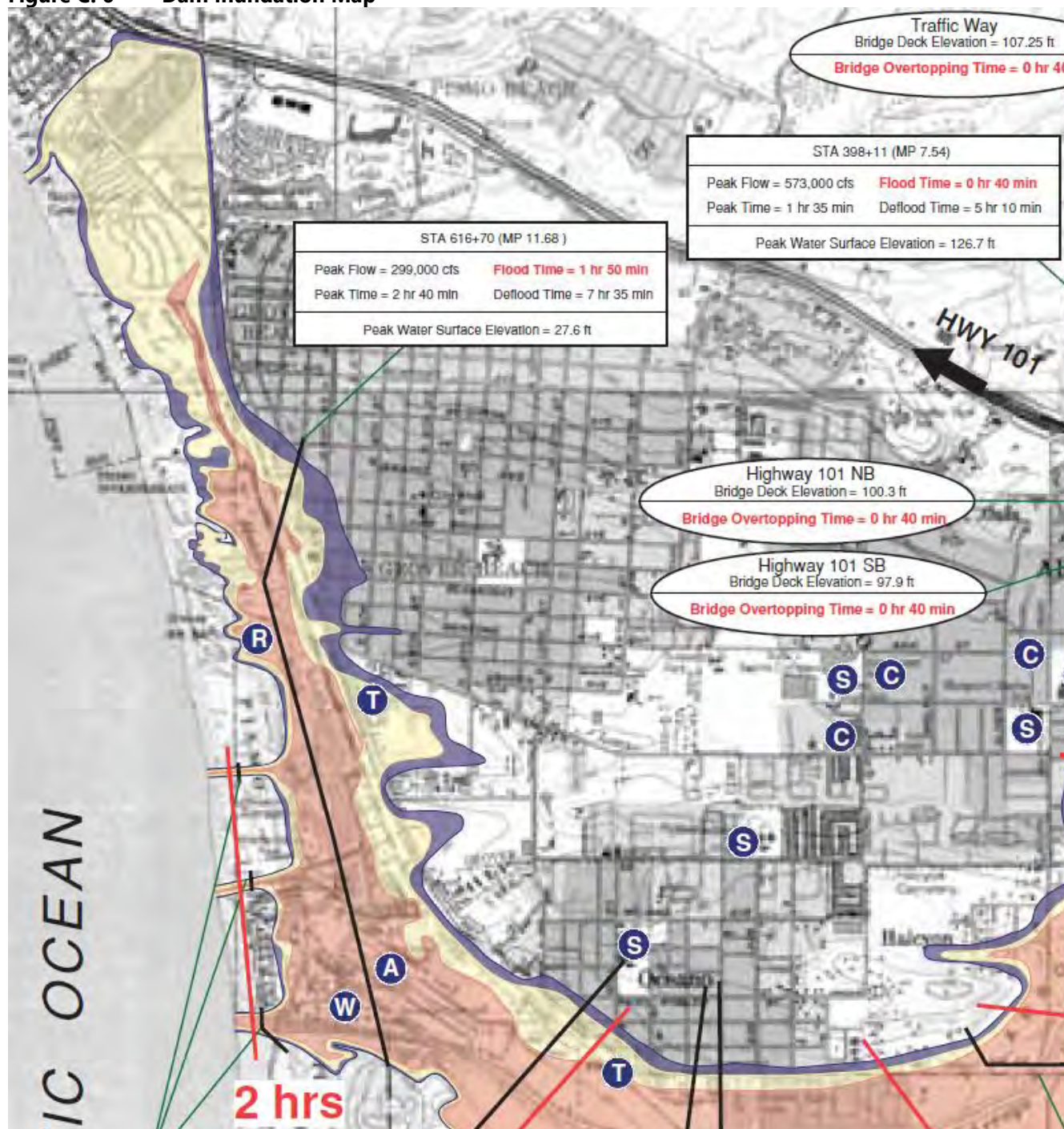
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A horizontal number line with tick marks at 0, 1, and 2. The label "2 Miles" is placed at the right end of the line.





Figure C. 6 Dam Inundation Map



Source San Luis Obispo County



Drought and Water Shortage

The City of Grover Beach's main water supplies are from surface water and groundwater. The surface water supply source is Lake Lopez or the Lopez Project, which is also the main supply for the other communities in the Five Cities Area. Grover Beach has an entitlement of 800 acre-feet per year (afy) from the Lopez Project. Grover Beach also receives a portion of its water supply (1,198 afy) from the Arroyo Grande Plain of the Tri-Cities Mesa Subbasin of the Santa Maria Valley Groundwater Basin which also supplies water for the cities of Arroyo Grande, Pismo Beach and the Oceano CSD. A majority of water consumption is by residential properties. According to the San Luis Obispo Council of Government (COG) report, 2050 Regional Growth Forecast for San Luis Obispo County (2017), the figure below shows the projected water demand in the City of Grover Beach from 2015 to 2030. The City of Grover Beach's population is not expected to grow dramatically by 2035 and as a result the water demand is not projected to increase over the next 20 to 30 years.

Figure C.7 Projected Water Demand in Grover Beach, 2015 to 2030

Water Supply and Demand and Beacon Projections	2015	2020	2025	2030	2035
Projected Supply Utilization	2,207	2,207	2,207	2,207	2,207
Projected Demand	1,149	1,186	1,223	1,254	1,227
Beacon Demand Projection	1,099	1,153	1,201	1,237	1,209
Supply Less Demand	1,108	1,054	1,006	970	998

Source: City of Grover Beach, 2010 Urban Water Management Plan, personal communications with Grover Beach staff, Beacon Economics (population projections)

Source: 2050 Regional Growth Forecast for San Luis Obispo County, San Luis Obispo Council of Governments and Beacon Economics, June 2017

Severe drought events in recent years have caused concerns on the impact on the City's limited water supply. In 2006 the City of Grover Beach adopted the Water Shortage Contingency Plan which defines what constitutes a recommendation for a water shortage proclamation, provides specific triggers for actions stages and designated responsibilities of City Council and Departments. The Grover Beach City Council annually reviews rainfall and other information on water amounts, and determines the appropriate actions to take. In 2014, with the below average rainfall and low storage levels in Lopez Lake, City Council determined the City's water supplies were headed towards a condition of severe water shortage. As a result, on June 16, 2014 the City Council declared a Stage III Water Shortage and mandatory water conservation measures. The City had previously been under a Stage II Declaration for two years that placed voluntary prohibitions on water usage. The Declaration required those voluntary prohibitions become mandatory and all customers to reduce their water usage by 10 percent. Stage III also gave the City the authority to impose penalties for failure to comply with water reduction or use prohibitions.

The returned Data Collection Guide from the City of Grover Beach Planning Team noted that due to the region's water supply being served by a mix of reservoir and pumped well water, the state-wide drought in California has led to regional impacts, including watering restrictions that according to the Planning Team has led to landscaping on many properties to die, increasing the risk of wildfire for some properties.



Earthquake

The City of Grover Beach is vulnerable to various types of seismic hazards including fault rupture, groundshaking and liquefaction. The Wilmar Avenue fault is the only mapped fault near the City of Grover Beach. The fault runs along the northern portion of the City limits. The Wilmar Avenue fault is exposed in the sea cliff near Pismo Beach and buried portions are generally aligned along the Highway 101. The fault is considered potentially active and a moderate fault rupture hazard to the City of Grover Beach.

In addition to the Wilmar Avenue fault there are a number of active and potentially active faults in proximity of the Grover Beach that are capable of producing strong groundshaking within the City limits. According to the Technical Background Report of the County Safety Element (1999), the San Andreas fault and the offshore Hosgri fault present the most likely sources of groundshaking for Grover Beach. The following table from the Technical Background Report and recreated for the 2019 Hazard Mitigation Plan, show the potential sources of groundshaking and approximate distance from Grover Beach.

Table C.9 Sources of Groundshaking in the Vicinity of Grover Beach

Fault	Approximate Distance (kilometers)*	Maximum Earthquake	Maximum Probable Earthquake	Anticipated Acceleration Range (g)
Wilmar Avenue	1	6.5	4	0.1-0.7
Blind Thrust Point San Luis	3	7.5	6	0.3-0.7
Los Osos	9	7	5	0.1-0.4
Pecho	6	6.3	3	<0.1-0.3
Casmalia-Orcutt- Little Pine	19	7.5	6	0.1-0.4
Hosgri	21	7.5	6.5	0.2-0.3
Rinconada	23	7.5	6.3	0.1-0.3
Los Alamos- Base Line	27	7	5.8	0.1-0.2
San Andreas	66	8.3	8	0.1-0.2

*Measured from Grand Avenue and North 8th

Source: San Luis Obispo County Safety Element Technical Background Report, December 1999

As a coastal community, portions of Grover Beach are underlain by layers of unconsolidated sand and young alluvium which have a high potential to become liquefied during groundshaking events. The following table shows the various property types in the City of Grover Beach at risk of liquefaction. Based on this analysis residential property types, including mobile and manufactured homes, are at the greatest risk of liquefaction in Grover Beach compared to other types of properties in the community. There are 4,243 residential properties at risk with a combined improved value of \$747,660,747. Figure C.8 below depicts the areas of Grover Beach at risk of liquefaction.

**Table C.10 City of Grover Beach Moderate Liquefaction Risk by Property Type**

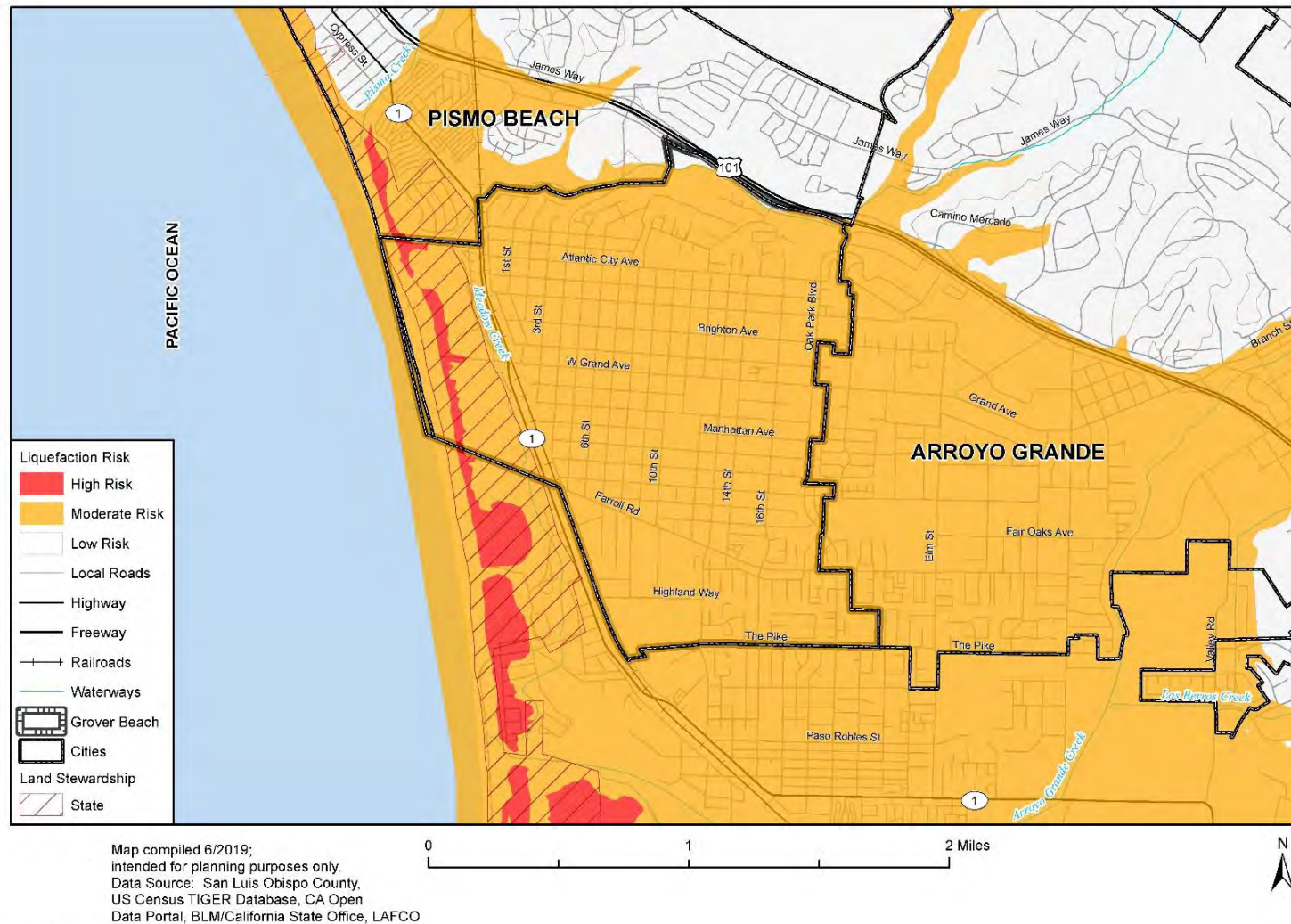
Property Type	Parcel Count	Improved Value
Agricultural	1	\$3,139
Commercial	242	\$71,707,475
Government/Utilities	37	\$21,533
Other/Exempt/Misc.	135	\$31,280,820
Residential	3,054	\$506,840,814
Multi-Family Residential	600	\$135,833,108
Mobile/Manufactured Homes	39	\$2,752,757
Residential: Other	550	\$102,234,078
Industrial	27	\$11,177,087
Vacant	27	\$4,262,765
Total	4,712	\$866,113,576

Source: San Luis Obispo County Planning and Building Dept., Assessor's Office, ParcelQuest, Wood Plc Parcel Analysis





Figure C.8 Areas of the City of Grover Beach at Risk of Liquefaction





Flood

The City of Grover Beach suffers from regular flooding in isolated areas. Flooding generally occurs after heavy rainfall events and overtopping of creeks and rivers. The Arroyo Grande Creek poses a risk of overtopping and causes Meadow Creek to flood along the western and northern portions of the City. Flooding along Meadow Creek has caused roads to be blocked by flood waters, causing difficulties in access to and egress from portions of the City. According to the City's Safety Element, northern and western portions of the City adjacent to Meadow Creek are at the greatest risk of being impacted by a 100-year flood. The areas at risk of flooding in the northern portions of the City are isolated to an area south of U.S. 101 and north of Nacimiento Avenue where a mobile home subdivision is located. The South Grover Beach and West Grover Beach neighborhoods are also reported to experience flooding issues. Flooding in the western portion of the City is isolated to areas west of the Union Pacific Railroad tracks and areas just east of the railroad tracks in the southwest corner of the City where drainage is trapped by the railroad grade.

The City's 2015 LHMP notes two properties located below street level that are subject to local flooding issues. One parcel located at South 5th Street and Manhattan Avenue is subject to flooding from a 50-year storm event when sandbags are not used or if cars are parked on the street. The second parcel is located at 6th Street and Mentone Avenue is subject to a 75-100-year storm event, but after an asphalt berm was constructed flooding was alleviated under storms of lesser magnitude. Refer to the Flood Section in the Base Plan for further information on the areas of that are at risk of flooding as well as past flood events that have impacted the City of Grover Beach.

Values at Risk

A flood vulnerability assessment was completed during the 2019 update, following the methodology described in Section 5 of the Base Plan. Table C.11 and Table C.12 summarize the values at risk in the City's 100-year and 500-year floodplain, respectively. These tables also detail loss estimates for each flood.

Table C.11 City of Grover Beach's FEMA 1% Annual Chance Flood Hazard by Property Type

Property Type	Parcel Count	Improved Value	Content Value	Total Value	Loss Estimate
Commercial	1	\$751,181	\$751,181	\$1,502,362	\$375,591
Government/Utilities	4	--	--	\$0	\$0
Other/Exempt/Misc.	1	--	--	\$0	\$0
Residential	6	\$928,659	\$464,330	\$1,392,989	\$348,247
Mobile/Manufactured Homes	21	\$1,087,774	\$543,887	\$1,631,661	\$407,915
Total	33	\$2,767,614	\$1,759,398	\$4,527,012	\$1,131,753

Source: San Luis Obispo County Planning and Building Dept., Assessor's Office, ParcelQuest, Wood Plc Parcel Analysis

Table C.12 City of Grover Beach's FEMA 0.2% Annual Chance Flood Hazard by Property Type

Property Type	Parcel Count	Improved Value	Content Value	Total Value	Loss Estimate
Government/Utilities	1	--	--	\$0	\$0
Other/Exempt/Misc.	1	\$137,118	--	\$137,118	\$34,280
Mobile/Manufactured Homes	1	\$116,341	\$58,171	\$174,512	\$43,628
Vacant	1	\$62,500	--	\$62,500	\$15,625
Total	4	\$315,959	\$58,171	\$374,130	\$93,532

Source: San Luis Obispo County Planning and Building Dept., Assessor's Office, ParcelQuest, Wood Plc Parcel Analysis





Based on this analysis, the City of Grover Beach has significant assets at risk to the 100-year and greater floods. There are 33 improved parcels located within the 100-year floodplain for a total value of over \$4 million. An additional 4 improved parcels valued at \$374,130 fall within the 500-year floodplain.

Applying the 25 percent damage factor as previously described in Section 5 of the Base Plan, there is a 1 percent chance in any given year of a 100-year flood causing roughly \$1 million in damage in the City of Grover Beach, and a 0.2 percent chance in any given year of a 500-year flood causing \$1,225,285 in damages (combined damage from both floods). The tables above show the properties at risk to flooding in the City of Grover Beach in relation to the mapped floodplain, based on the parcels that have improvements and parcel centroids that intersect the flood hazard areas.

Limitations: This model may include structures in the floodplains that are elevated at or above the level of the base-flood elevation, which will likely mitigate flood damage. Also, the assessed values are well below the actual market values. Thus, the actual value of assets at risk may be significantly higher than those included herein.

Population at Risk

Using parcel data from the County and the digital flood insurance rate map, population at risk was calculated for the 100-year and 500-year floods based on the number of residential properties at risk and the average number of persons per household (2.47). The following are at risk to flooding in the City of Grover Beach:

- 100-year flood— 68 people
- 500-year flood— 3 people
- **Total flood**— 71 people

Insurance Coverage, Claims Paid, and Repetitive Losses

The City of Grover Beach joined the National Flood Insurance Program (NFIP) on August 1, 1984. NFIP Insurance data indicates that as of April 18, 2019, there were 36 flood insurance policies in force in the City with \$9,940,700 of coverage. All 36 policies were residential (32 for single-family homes, 2 for 2-4-unit homes and 2 for all other residential). There are 8 policies in A01-30 & AE zones and no policies in A zones. The remaining 28 are in B, C, and X zones.

There have been 2 historical claims for flood losses totaling \$14,881.56. Both claims were for residential properties (1 single family and 1 2-4 family) and were in B, C or X zones; According to the FEMA Community Information System accessed 4/18/2019 there are no Repetitive Loss or Severe Repetitive Loss properties located in the jurisdiction.

Critical Facilities at Risk

Critical facilities are those community components that are most needed to withstand the impacts of disaster as previously described. Based on GIS analysis of the provided critical facility dataset by the County of San Luis Obispo combined with the HIFLD dataset, there are no critical facilities at risk of flooding in a 100-year or 500-year storm event. However, the Planning Team notes that the City's Train Station as well as the Nacimiento Sanitary Sewer Lift Station (and possibly other critical facilities not included in the countywide dataset used for analysis) should be at risk of flooding of the 100-year event, as they fall within the AE special flood hazard areas.

Coastal Storm/Coastal Erosion/Sea Level Rise

The City of Grover Beach is characterized by its sandy beaches backed by low sand dunes covered with dense vegetation. The sandy beaches provide structures and development with moderate protection from storm





waves, although active erosion of beaches and dunes currently impacts low-lying coastal recreation uses (i.e. golf course), commercial, and residential (i.e. mobile homes) structures. The City has been impacted by storm wave hazards in the past; during a winter storm in 1983, timber beach access ramps were damaged by storm waves. Refer to Section 5 of the Base Plan for more information on the risk that coastal hazards pose to San Luis Obispo County and the City of Grover Beach.

As part of the 2019 HMP planning effort, a sea level rise risk assessment was completed to determine how sea level rise may affect coastal jurisdictions and critical facilities and how coastal flooding might be exacerbated in the future. Table C.13 and Table C.14 summarize the properties at risk of inundation by sea level rise and sea level rise combined with a 1% annual chance coastal flood. The area of inundation by sea level rise and sea level rise combined with the 1% coastal flood are shown in Figure C.9 and Figure C.10, respectively. No critical facilities were determined to be at risk in the sea-level rise scenarios. See subsection 5.3.7 Coastal Storm/Coastal Erosion/Sea Level Rise in the base plan for more details on the scenarios and data sources used for this analysis.

Table C.13 Properties Inundated by Sea Level Rise and Sea Level Rise with 1% Annual Chance Flood

Property Type	25-cm SLR	75-cm SLR	300-cm SLR	25-cm SLR w/ 1% Flood	75-cm SLR w/ 1% Flood	300-cm SLR w/ 1% Flood
Commercial	--	--	6	--	--	6
Government/Utilities	--	--	4	--	--	7
Other/Exempt/Misc.	--	--	4	--	--	9
Residential	--	--	2	--	--	15
Multi-Family Residential	--	--	3	--	--	9
Mobile/Manufactured Homes	--	--	--	--	--	1
Industrial	--	--	1	--	--	3
Total	--	--	20	--	--	50

Source: Wood analysis with USGS CoSMoS 3.1 data

Table C.14 Improved Values of Properties Inundated by Sea Level Rise and Sea Level Rise with 1% Annual Chance Flood

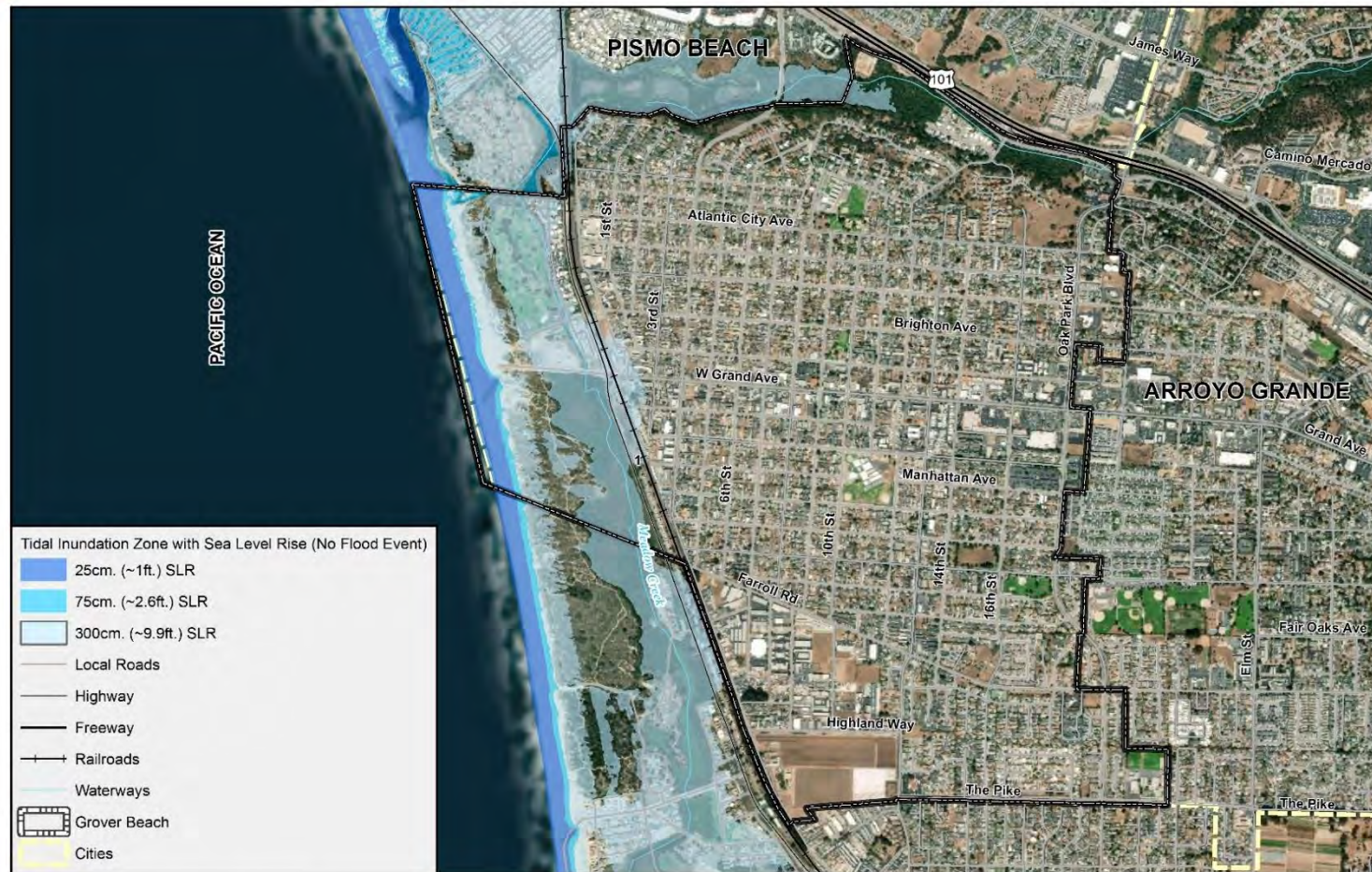
Property Type	25-cm SLR	75-cm SLR	300-cm SLR	25-cm SLR w/ 1% Flood	75-cm SLR w/ 1% Flood	300-cm SLR w/ 1% Flood
Commercial	--	--	\$834,388	--	--	\$834,388
Government/Utilities	--	--	--	--	--	--
Other/Exempt/Misc.	--	--	\$3,181,722	--	--	\$3,883,627
Residential	--	--	\$198,637	--	--	\$1,675,517
Multi-Family Residential	--	--	\$971,575	--	--	\$3,466,989
Mobile/Manufactured Homes	--	--	--	--	--	\$305,343
Industrial	--	--	\$62,392	--	--	\$107,956
Total	--	--	\$5,248,714	--	--	\$10,273,820

Source: Wood analysis with USGS CoSMoS 3.1 data





Figure C.9 Grover Beach Sea Level Rise Scenario Analysis: Tidal Inundation Only



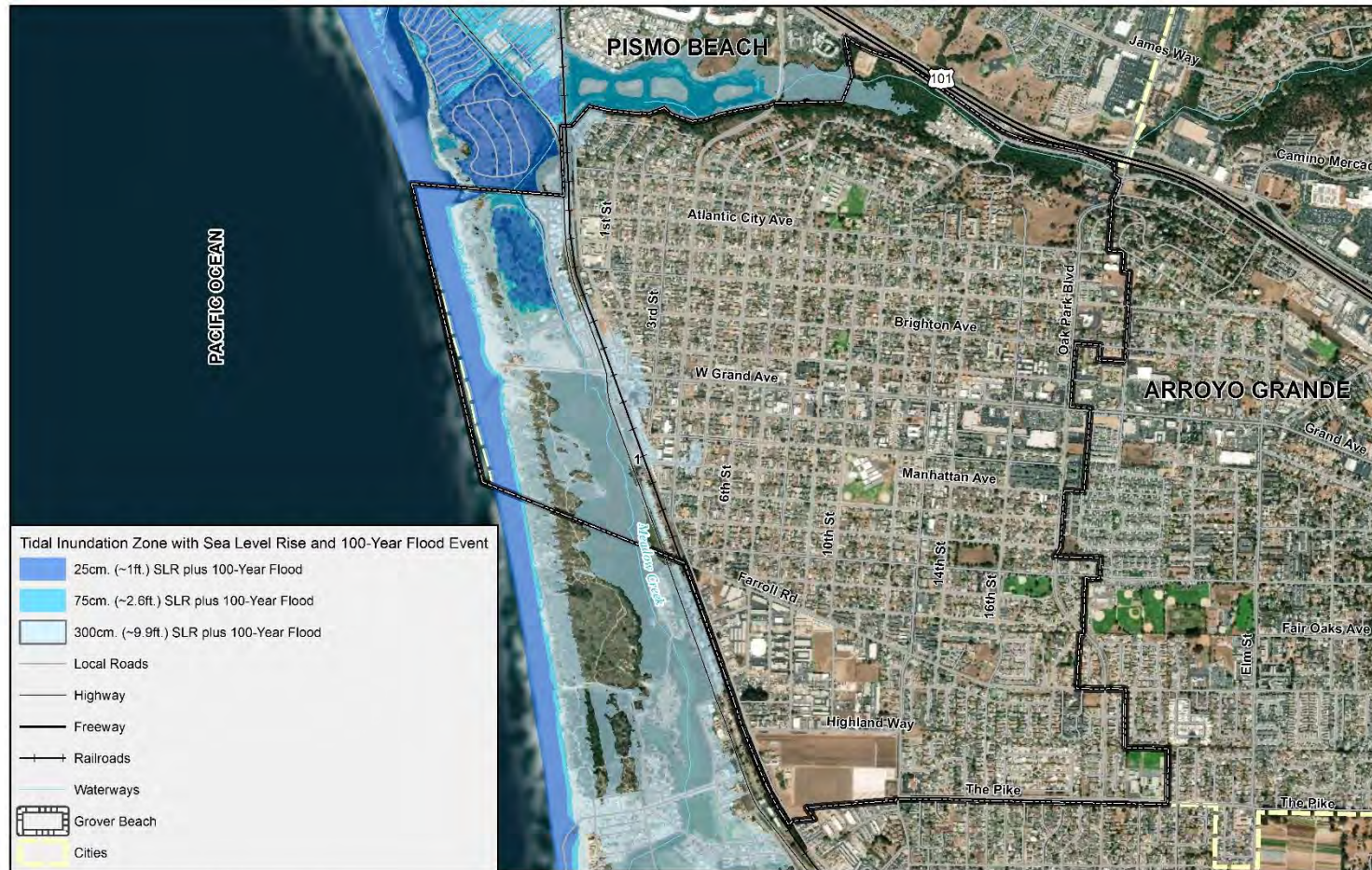
Map compiled 8/2019;
intended for planning purposes only.
Data Source: USGS CoSMoS v3.1.
San Luis Obispo County, US Census TIGER
Database, CA Open Data Portal, LAFCO.
Note: SLR = Sea Level Rise

0 0.5 1 Miles





Figure C.10 Grover Beach Sea Level Rise Scenario Analysis: Tidal Inundation and 1% Annual Chance Flood



Map compiled 8/2019;
intended for planning purposes only.
Data Source: USGS CoSMoS v3.1,
San Luis Obispo County, US Census TIGER
Database, CA Open Data Portal, LAFCO.
Note: SLR = Sea Level Rise

0 0.5 1 Miles





Tsunami and Seiche

Tsunami inundation poses a risk to all coastal communities in the County of San Luis Obispo. Offshore faults and related seismic activity could cause a tsunami event off the coast of Grover Beach, even if the faults are thousands of miles away. Grover Beach's wide beaches and coastal dunes in general provide protection from coastal hazards, although the low-lying areas where Meadow Creek meets the ocean is considered to be at moderate risk of tsunami hazards. Based on the GIS analysis there is one critical facility, a water treatment facility, that is at risk of tsunami inundation. According to the City's 2015 LHMP the areas shown on Figure C.8 are vulnerable to tsunami hazards.

Table C.15 below breaks down the tsunami risk in the City of Grover Beach by property type.

Table C.15 Properties at Risk of Tsunami Inundation

Property Type	Property Count	Improved Value	Content Value	Total Value	Loss Estimate	Population
Commercial	64	\$11,703,763	\$11,703,763	\$23,407,526	\$23,407,526	--
Government/Utilities	14	--	--	\$0	\$0	--
Other/Exempt/Misc.	34	\$15,190,469	--	\$15,190,469	\$15,190,469	--
Residential	59	\$6,180,075	\$3,090,038	\$9,270,113	\$9,270,113	148
Multi-Family Residential	31	\$8,830,232	\$4,415,116	\$13,245,348	\$13,245,348	78
Mobile/Manufactured Homes	1	\$305,343	\$152,672	\$458,015	\$458,015	3
Residential: Other	8	\$1,100,411	\$550,206	\$1,650,617	\$1,650,617	20
Industrial	14	\$5,461,004	\$8,191,506	\$13,652,510	\$13,652,510	--
Vacant	8	\$1,859,350	--	\$1,859,350	\$1,859,350	--
Total	233	\$50,630,647	\$28,103,300	\$78,733,947	\$78,733,947	249

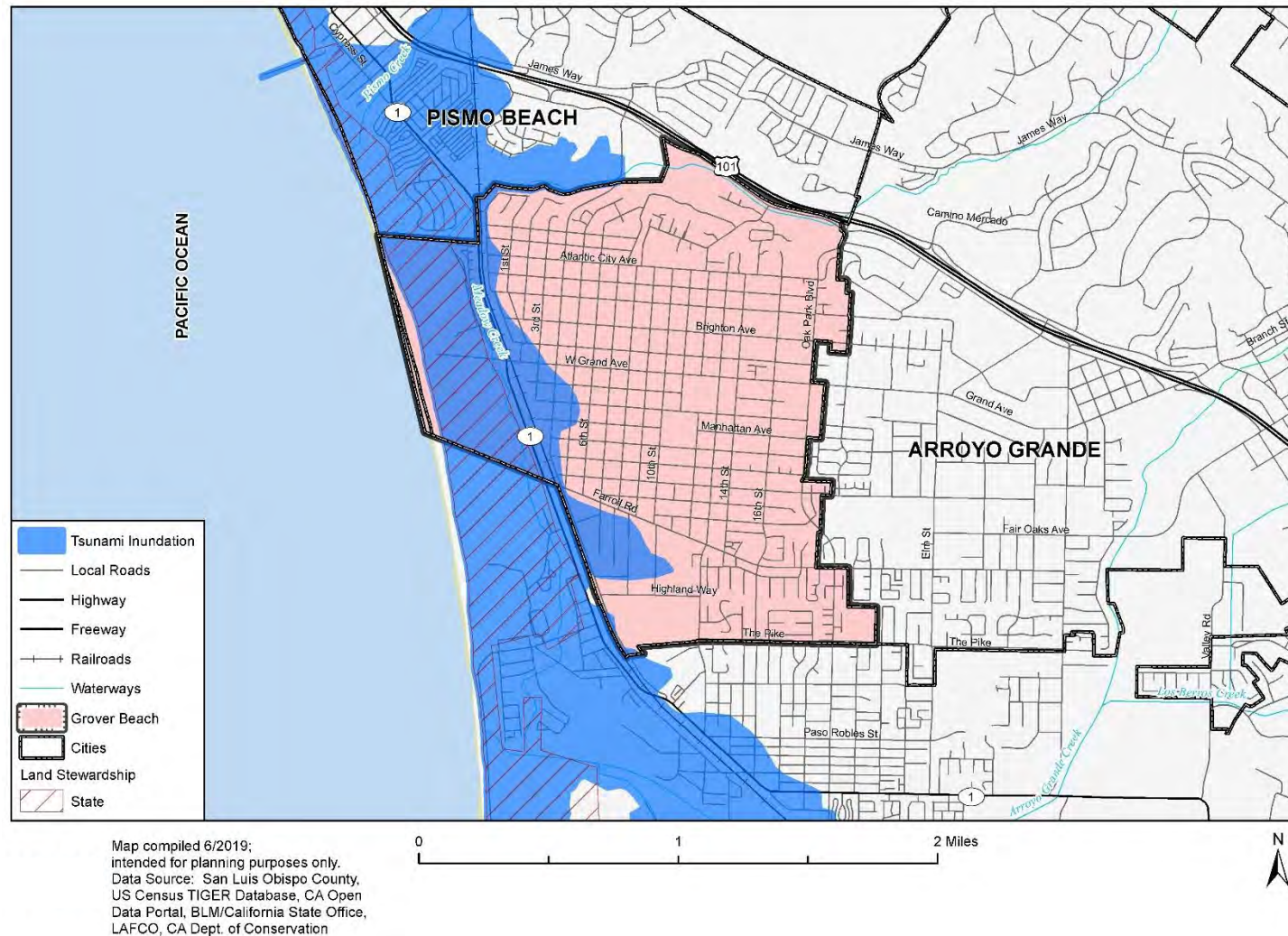
Source: San Luis Obispo County Planning and Building Dept., Assessor's Office, ParcelQuest, Wood Plc Parcel Analysis

Based on this analysis there are 233 properties with a combined value of over \$78 million vulnerable to the impacts of a tsunami. Of the properties at risk, 99 are residential properties (including mobile/manufactured homes) and have a combined loss estimate of over \$16 million and 64 are commercial properties.





Figure C.11 Areas of City of Grover Beach at Risk to Tsunami Inundation





The area along Highway 1 is also expected to be in the tsunami inundation zone, which would have cascading impacts on people being able to evacuate. The LPT noted that Grover Beach swells with beachgoing tourists including an estimated 10,000 to 40,000 visitors to the Oceano Dune State Park on a busy summer weekend or holiday; these visitors may not be familiar with the risk posed by tsunamis, leading them to ignore warnings. Refer to Section 5 of the Base Plan for additional information related to the past tsunami events and analysis on future vulnerability.

Human Caused: Hazardous Materials

The Cal OES Warning Center reports 21 hazardous materials incidents in the City of Grover Beach from 1994 through October 24, 2018; as noted in subsection 5.3.16 of the county plan, this likely excludes a large number of unreported minor spills. This constitutes 1% of the hazardous materials incidents reported county-wide during the same time frame and averages out to roughly 0.8 incidents per year. As noted in subsection 5.3.16, only around 6% of reported hazardous materials incidents result in injuries, fatalities, or evacuations. As shown in Base Plan there are no significant hazardous materials facilities located in the City. However, Grover Beach sits within the Emergency Planning Zone for the Diablo Canyon Nuclear Power Plant.

C.4 Capability Assessment

Capabilities are the programs and policies currently in use to reduce hazard impacts or that could be used to implement hazard mitigation activities. This capabilities assessment is divided into five sections: regulatory mitigation capabilities, administrative and technical mitigation capabilities, fiscal mitigation capabilities, mitigation outreach and partnerships, and other mitigation efforts.

To develop this capability assessment, the jurisdictional planning representatives used a matrix of common mitigation activities to inventory which of these policies or programs were in place. The team then supplemented this inventory by reviewing additional existing policies, regulations, plans, and programs to determine if they contributed to reducing hazard-related losses.

During the plan update process, this inventory was reviewed by the jurisdictional planning representatives and Wood consultant team staff to update information where applicable and note ways in which these capabilities have improved or expanded. Additionally, in summarizing current capabilities and identifying gaps, the jurisdictional planning representatives also considered their ability to expand or improve upon existing policies and programs as potential new mitigation strategies. The City of Grover Beach's capabilities are summarized below.





C.4.1 Regulatory Mitigation Capabilities

Table C.16 City of Grover Beach Regulatory Mitigation Capabilities

Regulatory Tool	Yes/No	Comments
General plan	Yes	
Zoning ordinance	Yes	
Subdivision ordinance	Yes	
Growth management ordinance	Yes	
Floodplain ordinance	Yes	Chapter 5 Development Code, 2012
Other special purpose ordinance (stormwater, water conservation, wildfire)	Yes	Stormwater only
Building code	Yes	
Fire department ISO rating	Yes	3
Erosion or sediment control program	Yes	
Stormwater management program	Yes	
Site plan review requirements	Yes	
Capital improvements plan	Yes	
Economic development plan	Yes	City of Grover Beach Final Economic Development Strategy April 11, 2017
Local emergency operations plan	Yes	
Other special plans	Yes	Local Coastal Program (Aug. 15, 2014), Open Space Management Plan, Continuity of Operations Plan; Recovery Plan
Flood Insurance Study or other engineering study for streams	Yes	
Elevation certificates (for floodplain development)	Yes	

C.4.2 Administrative/Technical Mitigation Capabilities

Table C.17 identifies the personnel responsible for activities related to mitigation and loss prevention in Grover Beach



**Table C.17 City of Grover Beach Administrative/Technical Mitigation Capabilities**

Personnel Resources	Yes/ No	Department/Position
Planner/engineer with knowledge of land development/land management practices	Yes	Community Development, Public Works Director/Engineer
Engineer/professional trained in construction practices related to buildings and/or infrastructure	Yes	Public Works Director/Engineer, Building official (contract)
Planner/engineer/scientist with an understanding of natural hazards	Yes	Public Works Director/Engineer, Building official (contract)
Personnel skilled in GIS	Yes	Community Development
Full time building official	No	Contract
Floodplain manager	Yes	Public Works Director/Engineer (?)
Emergency manager	Yes	
Grant writer	No	
GIS Data Resources (Hazard areas, critical facilities, land use, building footprints, etc.)	Yes	
Warning systems/services (Reverse 9-11, outdoor warning signals)	Yes	

C.4.3 Fiscal Mitigation Capabilities

Table C.18 identifies financial tools or resources that the City could potentially use to help fund mitigation activities.

Table C.18 City of Grover Beach Fiscal Mitigation Capabilities

Financial Resources	Accessible/Eligible to Use (Yes/No)
Community Development Block Grants	Yes
Capital improvements project funding	Yes
Authority to levy taxes for specific purposes	Yes (As needed)
Fees for water, sewer, gas, or electric services	No
Impact fees for new development	Yes
Incur debt through general obligation bonds	Yes
Incur debt through special tax bonds	Yes
Incur debt through private activities	No
Withhold spending in hazard prone areas	No

C.4.4 Opportunities for Enhancement

Based on the capabilities assessment, the City of Grover Beach has several existing mechanisms in place that already help to mitigate hazards. In Grover Beach's 2015 LHMP the City conducted a "self-assessment of capability" in which they rated (limited to high) the degree of capability they believed the community had. The City noted having a high degree of capability for planning and regulatory capabilities and political capability, but a moderate rating for their administrative, technical, and fiscal capabilities. This may be an opportunity for the City to expand or improve on these policies and programs to further protect the community. Future



improvements may include providing training for staff members related to hazards or hazard mitigation grant funding in partnership with the County and Cal OES. Additional training opportunities will help to inform City staff members on how best to integrate hazard information and mitigation projects into their departments. Continuing to train City staff on mitigation and the hazards that pose a risk to the City of Grover Beach will lead to more informed staff members who can better communicate this information to the public.

C.5 Mitigation Strategy

C.5.1 Mitigation Goals and Objectives

During the 2019 Planning Process the Grover Beach Planning Team reviewed the mitigation goals and objectives from the 2015 LHMP and determined the existing number and intent of the goals and objectives continue to be appropriate, and no revisions or additions were necessary. The City of Grover Beach's 2019 hazard mitigation goals and objectives are the following:

Goal 1. Minimize the level of damages and losses due to earthquake.

Objective 1.a - Develop a comprehensive approach to reducing the level of damage and losses due to earthquakes.

Objective 1.b – Perform a safety review of all current City structures and facilities, paying close attention to disaster proofing all facilities. Convene a group of department heads to prioritize the needs and research funding strategies.

Objective 1.c – Develop disaster preparedness caches of supplies, tools, and equipment for use by City employees, so that they may continue to perform their duties during a major emergency.

Goal 2. Minimize the level of damage and losses due to flooding.

Objective 2.a – Research and identify flooding vulnerability within the City of Grover Beach.

Goal 3. Minimize the level of damage and losses to people due to wildland and structure fires.

Objective 3.a – Educate the public about wildland and structure fire danger.

Goal 4. Minimize the level of damage and losses to people and surrounding areas due to tsunami events and increase understanding and response to tsunamis.

Objective 4.a – Increase the understanding and response to tsunamis within the community by working with Federal and State agencies to better understand and prepare for the hazards of tsunamis, and improve the ability to respond to tsunami warnings provided by NOAA's West Coast and Alaska Tsunami Warning Center.

Goal 5. Minimize the potential for dam failure and the impacts from such incidents.

Objective 5.a – Work with regional partners to reduce the negative impact on the community as a result of a dam incident or failure through proper planning and infrastructure maintenance and improvement.

Objective 5.b – Develop a public outreach program to educate residents and businesses in the dam failure inundation areas on their responsibilities and emergency preparedness.





Objective 5.c – Develop a dam failure emergency response plan.

Objective 5.d – Develop a hazard alert system to allow the city and regional partners to contact and alert our residents and businesses about the possibility of a dam failure and flooding caused by a dam failure.

Continued Compliance with the National Flood Insurance Program

The City has been an NFIP participating community since 1984. In addition to the mitigation actions identified herein the City will continue to comply with the NFIP. This includes ongoing activities such as enforcing local floodplain development regulations, including issuing permits for appropriate development in Special Flood Hazard Areas and ensuring that this development is mitigated in accordance with the regulations. This will also include periodic reviews of the floodplain ordinance to ensure that it is clear and up to date and reflects new or revised flood hazard mapping.

C.5.2 Completed 2015 Mitigation Actions

Grover Beach has not completed any of the mitigation actions from the 2015 LHMP, although of Grover Beach's thirteen mitigation actions, nine (9) are implemented annually and two (2) are in progress to be completed. These actions that are implemented annually help to reduce vulnerability to hazards and increase local capability to implement additional mitigation actions.

C.5.3 Mitigation Actions

The planning team for the City of Grover Beach identified and prioritized the following mitigation actions based on the risk assessment. Background information and information on how each action will be implemented and administered, such as ideas for implementation, responsible office, potential funding, estimated cost, and timeline, are also included. Actions were prioritized using the process described in subsection 7.2.1 of the Base Plan. Actions with an '*' are those that mitigate losses to future development.





Table C. 19 City of Grover Beach's Mitigation Action Plan

ID	Hazard(s) Mitigated	Description/Background/Benefits	Lead Agency and Partners	Cost Estimate	Potential Funding	Priority	Timeline	Status/ Implementation Notes
GB.1	Adverse Weather: Wind, Rain, Heat	Reduce the negative impact on the community due to weather-related incidents that could include heavy rain, high winds and extreme heat. Benefits: Improved water runoff in low-lying areas, reduced pooling and low impact street flooding; tree trimming, and removal of old trees will reduce falling limbs and trees	Public Works Department	\$125,000 - \$250,000	PDM grants; general funds; capital improvement funds; staff time	Low	3-5 yrs.	New
GB.2	Agricultural Pest Infestation and Disease	Help reduce the negative impact on the agricultural community due to pest infestation and disease. Benefits: Through community development and planning, work with existing agricultural property owners to develop safeguards to protect against pest infestation and disease	Community Development Department	Little to no Cost	Private funding and staff time	Medium	3-5 yrs.	New
GB.3*	Coastal Storm, Erosion and Sea Level Rise	Work in partnership with the State of California and County of San Luis Obispo to identify community impacts associated with coastal erosion through sea level rise and storms. In coordination with the State and County, map areas of the City that may be affected by sea level rise. Benefits: Lessen the impacts on the community from the effects of sea level rise and coastal erosion	Public Works Department; Community Development; Emergency Preparedness	Less than \$10,000	PDM grants; general funds; capital improvement funds; staff time	Medium	More than 5 yrs.	New
GB.4*	Dam Failure	In collaboration with state, county and other local governments, reduce the negative impact on the community as a result of a dam incident or failure through proper planning and infrastructure maintenance and improvement. City Staff will map areas of potential inundation via its Geographic Informational System and continue to implement the San Luis Obispo County Office of Emergency Services (OES) Emergency Plan. Benefits: Lessen the potential	Public Works Department; Community Development; Emergency Preparedness	Less than \$10,000	PDM grants; general funds; capital improvement funds; staff time	Medium	3-5 yrs.	New





ID	Hazard(s) Mitigated	Description/Background/Benefits	Lead Agency and Partners	Cost Estimate	Potential Funding	Priority	Timeline	Status/ Implementation Notes
		for dam failure and reduce the likelihood of this hazard occurring						
GB.5*	Drought	In collaboration with state, county and other local governments, reduce the negative impact of drought on the community through proper planning and infrastructure maintenance and improvement; continue to monitor well levels to prevent seawater intrusion while pursuing opportunities for regional recycled water projects that will result in groundwater injection; implement water efficient landscaping. Benefits: Avoid sea water intrusion; lessen potential negative impacts on the community as a result of drought or water shortage	Public Works; Community Development Department	Less than \$10,000	PDM grants; general funds; capital improvement funding; staff time	Medium	More than 5 yrs.	New
GB.6	Earthquake	Identify and catalog seismically vulnerable structures	Emergency Preparedness	Less than \$10,000	PDM Grant, General Funds, Capital Improvement funds, Staff time	High	More than 5 yrs.	Deferred. Limited URM structures. Limited staff and fiscal resources
GB.7*	Earthquake	Implement policies, procedures and regulations which reduce the exposure to earthquake hazards	Emergency Preparedness	Little to no cost	PDM Grant, General Funds, Capital Improvement funds, Staff time	High	More than 5 yrs.	Annual Implementation. Building and Fire Codes
GB.8	Earthquake	Protect the improved property and infrastructure vulnerable to earthquake hazards	Emergency Preparedness	Less than \$10,000	PDM Grant, General Funds, Capital Improvement	High	More than 5 yrs.	Annual Implementation. Building and Fire Codes





ID	Hazard(s) Mitigated	Description/Background/Benefits	Lead Agency and Partners	Cost Estimate	Potential Funding	Priority	Timeline	Status/ Implementation Notes
					funds, Staff time			
GB.9	Fire	Encourage the 100' Defensible Space around structures in the Wildland Urban Interface	Fire Department	Little to no cost	California Fire Safe Council, Fire Prevention Grant Funding, PDM Grant, General Funds, Capital Improvement funds, Staff Time	Medium	Annual	Annual Implementation
GB.10	Fire	Continue weed abatement program	Fire Department	Little to no cost	California Fire Safe Council, Fire Prevention Grant Funding, PDM Grant, General Funds, Capital Improvement funds, Staff Time	Medium	Annual	Annual Implementation
GB.11 *	Fire	Enforce building codes and ordinances that eliminate the use of wood shake roofs	Fire Department	Little to no cost	California Fire Safe Council, Fire Prevention	Medium	Annual	Annual Implementation





ID	Hazard(s) Mitigated	Description/Background/Benefits	Lead Agency and Partners	Cost Estimate	Potential Funding	Priority	Timeline	Status/ Implementation Notes
					Grant Funding, PDM Grant, General Funds, Capital Improvement funds, Staff Time			
GB.12 *	Fire	Enforce codes and ordinances that require fire sprinkler systems in all new structures constructed	Fire Department	Little to no cost	California Fire Safe Council, Fire Prevention Grant Funding, PDM Grant, General Funds, Capital Improvement funds, Staff Time	Medium	Annual	Annual Implementation
GB.13 *	Fire	Create a Fire-Smart Community by developing a comprehensive approach to reducing damage and loss due to fires; encourage the 100' defensible space around structures in the Wildland-Urban Interface (WUI); continue weed abatement program to reduce the threat of fire around open spaces; enforce building codes and ordinances that eliminate the use of wood shake roofs; enforce codes and ordinances that require fire sprinkler systems consistent with the California Building Code	Fire Department; Community Development; Emergency Preparedness	Little to no cost	California Fire Safe Council; Fire Prevention Grants; PDM Grants; FEMA funding; General Funding; Capital Improvement	Medium	More than 5 yrs.	New





ID	Hazard(s) Mitigated	Description/Background/Benefits	Lead Agency and Partners	Cost Estimate	Potential Funding	Priority	Timeline	Status/ Implementation Notes
					Funds; Staff Time			
GB.14 *	Flood	Implement policies procedures and regulations which reduce the exposure to flood hazards; protect the improved property, natural resources and life vulnerable to flood hazards; reduce the vulnerability of community assets, particularly research and identify flooding vulnerability within the city by identifying parcels with flood zones; identify funding needs and funding sources; apply for pre-disaster mitigation grants and commence mitigation projects; conclude mitigation projects; evaluate effectiveness of mitigation actions and critical facilities located in the 100-year floodplain	Public Works; Parks and Recreation; Community Development; Emergency Preparedness	Little to no cost	PDM grants; general funds; capital improvement funds; staff time	Medium	More than 5 yrs.	New
GB.15 *	Flood	Implement policies, procedures and regulations which reduce the exposure to flood hazards	Recreation and Maintenance Services, Public Works and Emergency Preparedness	Little to no cost	PDM Grant, General Funds, Capital Improvement funds, Staff time	High	More than 5 yrs.	Annual Implementation
GB.16	Flood	Protect the improved property and infrastructure vulnerable to flood hazards	Recreation and Maintenance Services, Public Works and Emergency Preparedness	\$500,000 to \$1,000,000	PDM Grant, General Funds, Capital Improvement funds, Staff time	High	More than 5 yrs.	Annual Implementation





ID	Hazard(s) Mitigated	Description/Background/Benefits	Lead Agency and Partners	Cost Estimate	Potential Funding	Priority	Timeline	Status/ Implementation Notes
GB.17	Flood	Reduce the vulnerability of community assets, particularly critical facilities, located in the 100-year floodplain	Recreation and Maintenance Services, Public Works and Emergency Preparedness	\$500,000 to \$1,000,000	PDM Grant, General Funds, Capital Improvement funds, Staff time	High	More than 5 yrs.	Annual Implementation
GB.18	Hazardous Materials	Require businesses that use, store or transport hazardous materials to ensure that adequate measures are taken to protect public health and safety; coordinate with allied agencies to prepare for hazmat incidents; support training and exercises in response to hazmat incidents; coordinate responses and investigations with the county hazmat team and Five Cities Fire; add gas pipeline mapping to the City's GIS resources; continue to monitor the manufacture, storage, transport of hazardous materials by working with environmental health and public safety agencies to identify effective mitigation actions or requirements that will help reduce the risk of incidents, including the spread of released materials; coordinate with the rail line industries to prepare for train-related hazmat incidents	Fire Department; Community Development; Emergency Preparedness	Less than \$10,000	California Fire Safe Council; Fire Prevention Grants; PDM Grants; FEMA funding; General Funding; Capital Improvement Funds; Staff Time	Medium	3-5 yrs.	New
GB.19	Tsunami	Develop a comprehensive action plan to reduce damage from a tsunami; display standardized and easy to read signs alerting community members of tsunami hazard zones, evacuation routes and evacuation sites; review tsunami inundation areas and educational needs; review emergency policies and training needs; review tsunami maps and evacuation plans	Public Works; Community Development; Emergency Services	\$10,000 to \$50,000	PDM grants; general funds; capital improvement funds; staff time	Medium	3-5yrs.	New





ID	Hazard(s) Mitigated	Description/Background/Benefits	Lead Agency and Partners	Cost Estimate	Potential Funding	Priority	Timeline	Status/ Implementation Notes
GB.20	Tsunami	Review Tsunami inundation areas and educational needs	Police Department	Little to no costs	PDM Grant, General Funds, Capital Improvement funds, Staff time	Medium	3-5 yrs.	In progress. Countywide Tsunami Plan, and identification of local resource needs. Staff and fiscal constraints
GB.21	Tsunami	Review emergency policies and training needs	Police Department	Little to no costs	PDM Grant, General Funds, Capital Improvement funds, Staff time	Medium	Annual	Annual Implementation
GB.22	Tsunami	Review Tsunami plans, maps, and evacuation plans	Police Department	Little to no costs	PDM Grant, General Funds, Capital Improvement funds, Staff time	Medium	3-5 yrs.	In progress. Countywide Tsunami Plan, and identification of local resource needs. County Fire Chiefs identified city-specific evacuation plans as a strategic priority. Staff and fiscal constraints
GB.23	Dam Failure	Work with our regional partners to reduce the negative impact on the community as a result of a dam incident or failure through proper planning and infrastructure maintenance and improvement.	Public Works Department, Community Development Department,	\$50,00 - \$100,000	PDM Grant, FEMA grant, General Funds, Capital Improvement	Medium	5 yrs	New





ID	Hazard(s) Mitigated	Description/Background/Benefits	Lead Agency and Partners	Cost Estimate	Potential Funding	Priority	Timeline	Status/ Implementation Notes
			Emergency Preparedness		funds, Staff time			
GB.24	Dam Failure	Develop a public outreach program to educate residents and businesses in the dam failure inundation areas on their responsibilities and emergency preparedness.	Public Works Department, Community Development Department, Emergency Preparedness	\$2,500 - \$5,000	PDM Grant, FEMA grant, General Funds, Capital Improvement funds, Staff time	Medium	2-3 yrs	New
GB.25	Dam Failure	Develop a dam failure emergency response plan.	Public Works Department, Community Development Department, Emergency Preparedness	\$5,000 to \$10,000	PDM Grant, FEMA grant, General Funds, Capital Improvement funds, Staff time	Medium	2-3 yrs	New
GB.26	Dam Failure	Develop a hazard alert system to allow the city and regional partners to contact and alert our residents and businesses about the possibility of a dam failure and flooding caused by a dam failure.	Public Works Department, Community Development Department, Emergency Preparedness	Less than \$1,000,000	PDM Grant, FEMA grant, General Funds, Capital Improvement funds, Staff time	Low - Medium	5 yrs	New

* mitigates losses to future development





C.6 Implementation and Maintenance

Moving forward, the City will use the mitigation action table in the previous section to track progress on implementation of each project. As illustrated in subsection 7.3.1 of the Base Plan, much progress has been made since the plan was originally developed. Implementation of the plan overall is discussed in Section 8 in the Base Plan.

C.6.1 Incorporation into Existing Planning Mechanisms

The information contained within this plan, including results from the Vulnerability Assessment, and the Mitigation Strategy will be used by the City to help inform updates and the development of local plans, programs and policies. The Public Works Department may utilize the hazard information when designing and implementing the City's capital improvement projects, and the Planning and Building Divisions within the Community Development Department may utilize the hazard information when reviewing a site plan or other type of development applications. The City will also incorporate this LHMP into the Safety Element of their General Plan, as recommended by Assembly Bill (AB) 2140.

As described in Section 8 Implementation and Monitoring, the HMPC representatives from Grover Beach will report on efforts to integrate the hazard mitigation plan into local plans, programs and policies and will report on these efforts at the annual HMPC plan review meeting.

C.6.2 Monitoring, Evaluation and Updating the Plan

The City will follow the procedures to monitor, review, and update this plan in accordance with San Luis Obispo County as outlined in Section 8 of the Base Plan. The City will continue to involve the public in mitigation, as described in subsection 8.3 of the Base Plan. The Chief of Police will be responsible for representing the City in the County HMPC, and for coordination with City staff and departments during plan updates. The City realizes it is important to review the plan regularly and update it every five years in accordance with the Disaster Mitigation Act Requirements as well as other State of California requirements.





D.1 Community Profile

D.1.1 Mitigation Planning History and 2019 Process

This Annex was created during the development of the 2019 San Luis Obispo County Hazard Mitigation Plan Update. This Jurisdictional Annex builds upon the previous version of the City of Paso Robles Local Hazard Mitigation Plan completed in February 2006; that previous mitigation plan was not incorporated into the City's General Plan, as this updated mitigation plan will be. A planned review of the City's regulations and procedure to ensure they reflect the goals established in the 2006 plan did not take place, but will be conducted following the adoption of this updated plan. The Fire Department's staff represented the City of Morro Bay on the County HMPC and took the lead for developing the plan and this annex in coordination with the Morro Bay Local Planning Team (Planning Team). A review of jurisdictional priorities found no significant changes in priorities since the last update.

The Local Planning Team will be responsible for implementation and maintenance of the plan. Table D.1 summarizes the City's planning team for the plan revision process.

Table D.1 Morro Bay Hazard Mitigation Plan Revision Planning Group

Department or Stakeholder	Title
Fire Department	Fire Marshall
Fire Department	Fire Chief
Police Department	Police Chief
Harbor Department	Harbor Director
Community Development	City Engineer

More details on the planning process followed and how the jurisdictions, service districts and stakeholders participated can be found in Section 3 of the Base Plan (Planning Process), as well as how the public was involved during the 2019 update.

D.1.2 Geography and Climate

The City of Morro Bay (City) is located on the central coast of California, bordered by the Pacific Ocean to the west, the Los Osos Community Services District to the south, and the Cayucos Community Services District to the north. A shallow agricultural valley extends eastward from the City limits, which is surrounded by the Santa Lucia Coastal Range to the north, the Seven Sisters on the south, and the City of San Luis Obispo to the east. The City's topography varies from level coastal terrain to rolling hills and a few steeper escarpments in the North Atascadero Beach area and Southern portions on Black Mountain. The City's elevations range from sea level to a height of approximately 640 feet on Black Mountain. The highest elevations in the vicinity are located in the Santa Lucia Coastal Range where many peaks are 2,000 to 3,400 feet above mean sea level (MSL). The vegetation throughout the City includes Central California Coastal Community habitats, particularly the coastal wetland habitat with diverse tree species and native chaparral communities.

The City of Morro Bay is a small coastal town in a rural setting. Morro Bay's harbor provides a port of refuge, a working waterfront, commercial fishing and recreational boating facilities, shopping and sightseeing, bird watching, and eco-tourism. In 1994, the Governor established Morro Bay as California's first State Estuary, and in October 1995 it was accepted into the National Estuary Program (NEP).





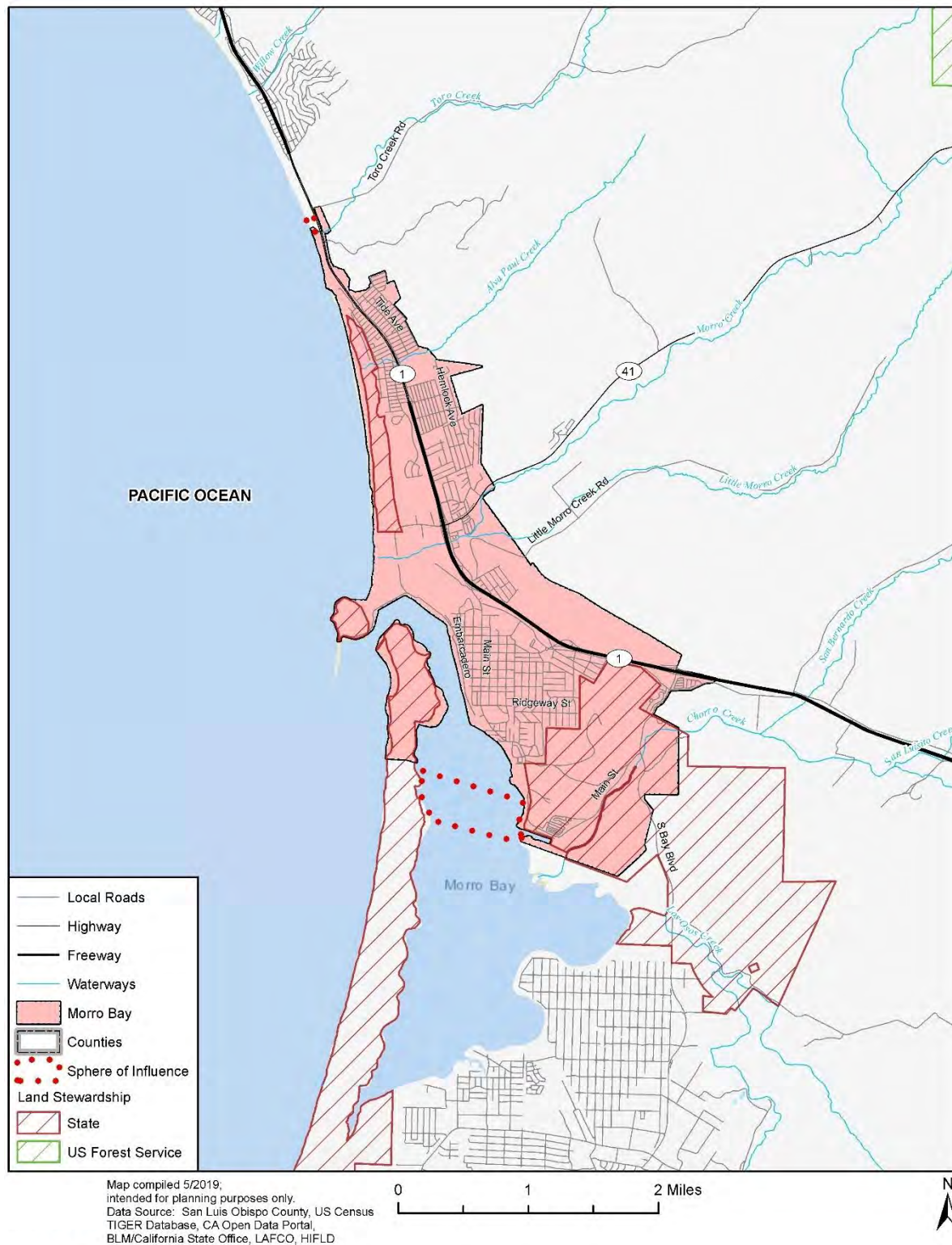
This portion of the central coast of California generally has cool, foggy summers and low rainfall. The Pacific Ocean exerts a tremendous influence on temperature. The area is characterized by a Coastal climate with a wet season from October to early April. In the City of Morro Bay, the total annual precipitation is approximately 20 to 25 inches. In winter, the average high temperatures range from the 50's to the 60's, with lows seldom reaching into the 30's. In summer, the average daily highs are in the 60's and 70's, while lows are typically in the 50's and 60's.

Figure D.1 below shows the location and geographic context of the City of Morro Bay.





Figure D.1 The City of Morro Bay





The City of Morro Bay 's existing Sphere of Influence is approximately 100+/- acres beyond the City limits and includes two general areas, one within the bay south of town adjacent to the marina and the other north of town along the beach (City of Morro Bay, 2017).

D.1.3 History

The City of Morro Bay is a small coastal town in a rural setting. What makes Morro Bay unique is an image reminiscent of California fishing ports in the 1950's and 1960's, a fishing village nestled in a rural setting around a bay and harbor with Morro Rock towering over the entrance. Morro Bay's harbor provides a port of refuge, a working waterfront, commercial fishing and recreational boating facilities, shopping and sightseeing, bird watching, and eco-tourism, all of which make it a unique tourist and recreation destination.

Archaeological evidence suggests that Native Americans including the Chumash Tribe settled in northern Santa Barbara County and San Luis Obispo County more than 9,000 years ago (City of Morro Bay Local Hazard Mitigation Plan, 2012). Following an annual cycle of hunting, fishing, fowling, and harvesting, the Native American peoples adapted to changing environmental conditions and grew into a large, complex society. In 1542, Juan Rodriguez Cabrillo, a Portuguese navigator, sailed into the bay named "Los Esteros." He is acknowledged as the first European to discover the land of Upper California, including the area now known as Estero Bay and Morro Bay. In 1870, the township of Morro Bay was established with a population of approximately 200.

Until the Second World War, the area was relatively undeveloped. Most of the small community of Morro Bay was built on the bluff tops. In 1942, the Department of the Navy initiated a national defense project to construct an amphibious training base in Morro Bay. From 1942 to 1944, the north and south breakwaters, the two T-Piers, and the inner harbor revetment from Coleman Beach to the sandspit were constructed. In addition, the federal government dredged the current Navy and Morro Channels and deposited the dredge spoils behind the inner harbor revetment to create the current Embarcadero Road area on what had previously been tidal flats.

In 1994, the Governor established Morro Bay as California's first State Estuary. In October 1995 Morro Bay was accepted into the National Estuary Program (NEP) primarily because of long-term grass-roots efforts and because it was the first ever State Estuary. The Morro Bay National Estuary Program (MBNEP) is one of 28 national programs currently working to safeguard the health of some of the nation's most important coastal areas. Like the NEP, the City of Morro Bay desires to protect and conserve the bay that bears its name.

D.1.4 Economy

In 2014, 80.4% of the 4,342 residents of Morro Bay were employed outside of the City limits (Morro Bay Economic Development Roadmap, 2017). Morro Bay is a largely built-out community with limited space for residential, commercial, and industrial growth; only 1.25% of the area is considered undeveloped, which limits the City's potential economic growth. Morro Bay contains four economic activity centers: Downtown, Embarcadero, Quintana, and North Main. Each of these economic centers have the opportunity for renovation and enhancement of space and development. Since Dynegy decommissioned their natural gas-burning power plant facility in 2015, the City's economic base has been driven mainly by commercial fishing and tourism.

The utilities infrastructure in the City includes water provision, and wastewater collection and treatment (City of Morro Bay Local Hazard Mitigation Plan, 2012). The public services infrastructure in the City include fire protection and emergency services, police protection, public schools, libraries, the harbor and its associated infrastructure, and solid waste collection and disposal.





Select estimates of economic characteristics for the City of Morro Bay are shown in Table D.2 below. Table D.3 and Table D.4 show the occupational and industry breakdown of the City of Morro Bay's labor force based on estimates from the 2013-2017 American Community Survey.

Table D.2 City of Morro Bay Economic Characteristics

Characteristic	City of Morro Bay
Population Estimates (as of 2018)	10,581
Population Percent Change (2010-2018 estimates)	3.4%
Persons under 5 Years, Percent	3.8%
Persons over 65 Years, Percent	27.7%
Foreign born Person, Percent (2013-2017)	10.5%
Median Gross Rent (2013-2017)	\$1,387
Median value of owner-occupied housing units (2013-2017)	\$535,300
High School Graduate or Higher, Percent (2013-2017)	91.4%
Mean Travel to Work in Minutes (2013-2017)	21.8
Median Household Income (in 2017 dollars, for 2013-2017)	\$61,690
Persons in Poverty, Percent	10.1%

Source: U.S. Census Bureau American Community Survey 2018 - <https://www.census.gov/quickfacts/morrobaycitycalifornia>

Table D.3 City of Morro Bay Employment by Occupation

Occupation	% Employed	# Employed
Sales and Office Occupations	22.6%	1,048
Management, Business, Science, and Arts Occupations	38.6%	1,792
Service Occupations	18.7%	869
Production, Transportation, and Material Moving Occupations	10.8%	501
Natural Resources, Construction, and Maintenance Occupations	9.3%	433
Total		4,643

Source: U.S. Census Bureau American Community Survey 2013-2017, 5-Year Estimates www.census.gov



**Table D.4 City of Morro Bay Employment by Industry**

Industry	% Employed	# Employed
Educational Services, and Health Care and Social Assistance	25.6%	1,187
Retail Trade	13.1%	610
Professional, Scientific, and Mgmt., and Administrative and Waste Mgmt. Services	13.6%	631
Manufacturing	4.5%	208
Arts, Entertainment, and Recreation, and Accommodation, and Food Services	13.5%	626
Construction	8.1%	377
Finance and Insurance, and Real Estate and Rental and Leasing	3.7%	171
Public Administration	3.2%	150
Other Services, Except Public Administration	5.8%	268
Wholesale Trade	2.0%	94
Transportation and Warehousing, and Utilities	3.8%	175
Agriculture, Forestry, Fishing and Hunting, and Mining	1.0%	48
Information	2.1%	98
Total		4,643

Source: U.S. Census Bureau American Community Survey 2013-2017, 5-Year Estimates www.census.gov

D.1.5 Population

In May 2019, the State Department of Finance released preliminary population data for the State to reflect wildfire-driven changes to local populations. According to the report, the City of Morro Bay had a population of 10,439 persons as of January 2019, which accounts for approximately 26.9% of the County's population. This is slightly less than accounted for in the 2018 U.S. Census Bureau estimates from 2018, possibly due to small migration amounts following the 2018 fires. Table D.5 below summarizes a few key population characteristics for the City of Morro Bay.



**Table D.5 City of Morro Bay Demographic and Social Characteristics**

Characteristic	City of Morro Bay
Gender/Age	
Male	5,228
Female	5,340,
Median age	49.4
Under 5 years	400
Under 18 years	1,508
65 years and over	2,929
Race/Ethnicity	
White	9,620
Asian	317
Black or African American	140
American Indian/Alaska Native	82
Hispanic or Latino (of any race)	1,362
Education	
High school graduate or higher	7,472
Disability Status	
Population with a disability	1,334

Source: U.S. Census Bureau American Community Survey 2013-2017 5-Year Estimates, www.census.gov

D.1.6 Development Trends

Measure F, a voter initiative imposing a hard population cap of 12,200 to preserve Morro Bay's small coastal town character, passed in 1984 (City of Morro Bay Local Hazard Mitigation Plan, 2012). Measure F estimated a population of 12,200 would be reached by the year 2000. In actuality, the population of Morro Bay has not reached said predictions and is currently approximated at 10,439 despite the addition of hundreds of housing units in Morro Bay during the period since passage of Measure F.

Despite the addition of many housing units and the lack of significant population pressure, housing prices in Morro Bay increased from \$146,000 for a median priced home in 1996 to a median price of over \$600,000 back in 2006. The median housing cost decreased in 2017 to approximately \$535,300, based on the U.S. Census Bureau estimates. Increased prices and decreased building opportunities has resulted in impacts to the cost of housing in the City. There are few vacant parcels within the City's boundaries, and due to the community's strong feelings toward the preservation of a small population size it is projected that future development will be infill and revitalization of existing parcels.

D.2 Hazard Identification and Summary

Morro Bay's planning team identified the hazards that affect the City and summarized their frequency of occurrence, spatial extent, potential magnitude, and significance specific to Morro Bay (Table D.6). There are no hazards that are unique to Morro Bay. The overall hazard significance considers the geographic area, probability and magnitude as a way to identify priority hazards for mitigation purposes. This is discussed further in the sections below.





Table D.6 City of Morro Bay – Hazard Summaries

Hazard	Geographic Area	Probability of Future Occurrence	Magnitude/Severity (Extent)	Overall Significance
Adverse Weather: Thunderstorm/Heavy Rain/Hail/Lightning/Dense Fog/Freeze	Extensive	Highly Likely	Limited	High
Adverse Weather: High Wind/Tornado	Significant	Highly Likely	Limited	Medium
Adverse Weather: Extreme Heat	Significant	Highly Likely	Limited	Medium
Coastal Storm/Coastal Erosion/Sea Level Rise	Extensive	Likely	Critical	High
Earthquake and Liquefaction	Significant	Occasional	Catastrophic	High
Flood	Extensive	Highly Likely	Critical	High
Hazardous Trees	Extensive	Highly Likely	Limited	High
Landslides and Debris Flow	Limited	Occasional	Limited	Medium
Tsunami and Seiche	Extensive	Occasional	Catastrophic	High
Wildfire	Extensive	Highly Likely	Catastrophic	High
Human Caused: Hazardous Materials	Limited	Occasional	Negligible	Medium
Geographic Area Limited: Less than 10% of planning area Significant: 10-50% of planning area Extensive: 50-100% of planning area Probability of Future Occurrences Highly Likely: Near 100% chance of occurrence in next year or happens every year. Likely: Between 10 and 100% chance of occurrence in next year or has a recurrence interval of 10 years or less. Occasional: Between 1 and 10% chance of occurrence in the next year or has a recurrence interval of 11 to 100 years. Unlikely: Less than 1% chance of occurrence in next 100 years or has a recurrence interval of greater than every 100 years.		Magnitude/Severity (Extent) Catastrophic—More than 50 percent of property severely damaged; shutdown of facilities for more than 30 days; and/or multiple deaths Critical—25-50 percent of property severely damaged; shutdown of facilities for at least two weeks; and/or injuries and/or illnesses result in permanent disability Limited—10-25 percent of property severely damaged; shutdown of facilities for more than a week; and/or injuries/illnesses treatable do not result in permanent disability Negligible—Less than 10 percent of property severely damaged, shutdown of facilities and services for less than 24 hours; and/or injuries/illnesses treatable with first aid Significance Low: minimal potential impact Medium: moderate potential impact High: widespread potential impact		





D.3 Vulnerability Assessment

The intent of this section is to assess the City of Morro Bay's vulnerability separately from that of the County, which has already been assessed in Section 5 Hazard Identification and Risk Assessment (HIRA) in the Base Plan. This vulnerability assessment analyzes the population, property, and other assets (e.g. critical facilities) at risk to hazards ranked of medium or high significance that may vary from other parts of the planning area.

The key information to support the HIRA for this Annex was collected through a Data Collection Guide, which was distributed to each participating municipality, community services district, or special district to complete during the planning process. Information collected was analyzed and summarized in order to identify and rank all the hazards that could impact anywhere within the County, as well as to rank the hazards and identify the related vulnerabilities unique to each jurisdiction/district. In addition, the Morro Bay planning team was asked to share information on past hazard events that have affected the district.

Each participating jurisdiction or district was in support of the main hazard summary identified in the Base Plan (See Table 5.2). However, the hazard summary rankings for each jurisdictional annex may vary slightly due to specific hazard risk and vulnerabilities unique to that jurisdiction (see Table D.6). Identifying these differences helps the reader to differentiate the district's risk and vulnerabilities from that of the overall County.

Note: The hazard "Significance" reflects overall ranking for each hazard and is based on the Morro Bay planning team input from the Data Collection Guide and the risk assessment developed during the planning process (see Section 5 of the Base Plan), which included more detailed quantitative and qualitative analyses with best available data for all hazards in the County.

The hazard summaries in Table D.6 reflect the hazards that could potentially affect the district in major ways. Based on this analysis, the priority hazards are listed below. The discussion of vulnerability for each of the assessed hazards is contained in the following sections. Hazards of Medium or High significance for Morro Bay are summarized below.

- Adverse Weather
- Earthquake and Liquefaction
- Flood
- Landslides and Debris Flow
- Coastal Storm/Coastal Erosion/Sea Level Rise
- Tsunami and Seiche
- Wildfire
- Human Caused: Hazardous Materials

Other Hazards

Hazards assigned a significance rating of Low may not be assessed at all within this annex. However, based on quantitative or historic occurrence proof of posing a risk to the community, certain hazards will be addressed for specific vulnerabilities in this annex (though perhaps in a limited capacity due to the Planning Team assigning a lower priority to said hazards). The hazards to the planning area which were rated by the Planning Committee are listed below. The majority were given minimum priority due to a lack of exposure, vulnerability, and/or no probability of occurrence or previous history or losses, though some will still contain a loss estimate discussion based again on potential risk to the district (if noted).

- Agricultural Pests and Plant Diseases





- Dam Incidents
- Drought and Water Shortage
- Land Subsidence

D.3.1 Assets at Risk

This section considers Morro Bay's assets at risk, including values at risk, critical facilities and infrastructure, historic assets, economic assets, and growth and development trends.

Values at Risk

Parcel geometry data was provided by ParcelQuest, a third-party service working alongside the San Luis Obispo County Assessor's Office to compile property information. The overall parcel data provided the baseline for an inventory of the total exposure of developed parcels within the County and helps to ensure that the updated Plan reflects changes in development. This data should only be used as a guideline to overall values in the City as the information has some limitations. It is also important to note that in the event of a disaster, it is generally the value of the infrastructure improvements that is of concern or at risk; generally, the land itself is not a loss. Table D.7 shows the exposure of properties (e.g., the values at risk based on improvement values, content values, and total values which are calculated by adding improvement and content values), broken down by parcel type for the City of Morro Bay

Table D.7 Parcel Exposure Values for the City of Morro Bay, by Parcel Types

Property Type	Parcel Count	Improved Value	Content Value	Total Value
Agricultural	1	\$4,833	\$4,833	\$9,666
Commercial	251	\$71,138,657	\$71,138,657	\$142,277,314
Government/Utilities	80	\$374,774	--	\$374,774
Other/Exempt/Misc.	131	\$19,391,746	--	\$19,391,746
Residential	4,060	\$799,126,269	\$399,563,135	\$1,198,689,404
Multi-Family Residential	568	\$127,309,679	\$63,654,840	\$190,964,519
Mobile/Manufactured Homes	16	\$2,971,790	\$1,485,895	\$4,457,685
Residential: Other	164	\$84,847,578	\$42,423,789	\$127,271,367
Industrial	8	\$757,564	\$1,136,346	\$1,893,910
Vacant	41	\$7,604,763	--	\$7,604,763
Total	5,320	\$1,113,527,653	\$579,407,494	\$1,692,935,147

Source: Wood Plc analysis based on ParcelQuest and San Luis Obispo County Assessor's Office data 2019

Critical Facilities and Infrastructure

A critical facility may be defined as one that is essential in providing utility or direction either during the response to an emergency or during the recovery operation.

An inventory of critical facilities in the District based on San Luis Obispo County GIS data as well as structures obtained from the Homeland Infrastructure Foundation-Level Dataset (HIFLD) is provided in Table D.8 as well as illustrated in Figure D.2. The four types of Critical Facilities categorized by San Luis Obispo County and its jurisdictions' and districts' planning teams are: Emergency Services, High Potential Loss Facilities, Lifeline Utility Systems, and Transportation Systems. Refer to subsection 5.2 of the Base Plan for more information on the Assets





used throughout this annex, including the definitions and categories of critical facilities, and the County-wide analyses.

Table D.8 City of Morro Bay's Critical Facilities

Facility Category	Facility Type	Counts
Emergency Services	Day Care Facilities	4
	Emergency Medical Service Stations	2
	Fire Stations	2
	Local Law Enforcement	1
	Nursing Homes	2
	Public Schools	2
High Potential Loss Facilities	Power Plants	1
Lifeline Utility Systems	Microwave Service Towers	2
	Wastewater Treatment Plants	1
	Energy Commission Facilities	1
Total		18

Source: San Luis Obispo County Planning and Building; LAFCO; HIFLD; Wood Plc analysis

Table D.9 Details on the City of Morro Bay's Critical Facilities

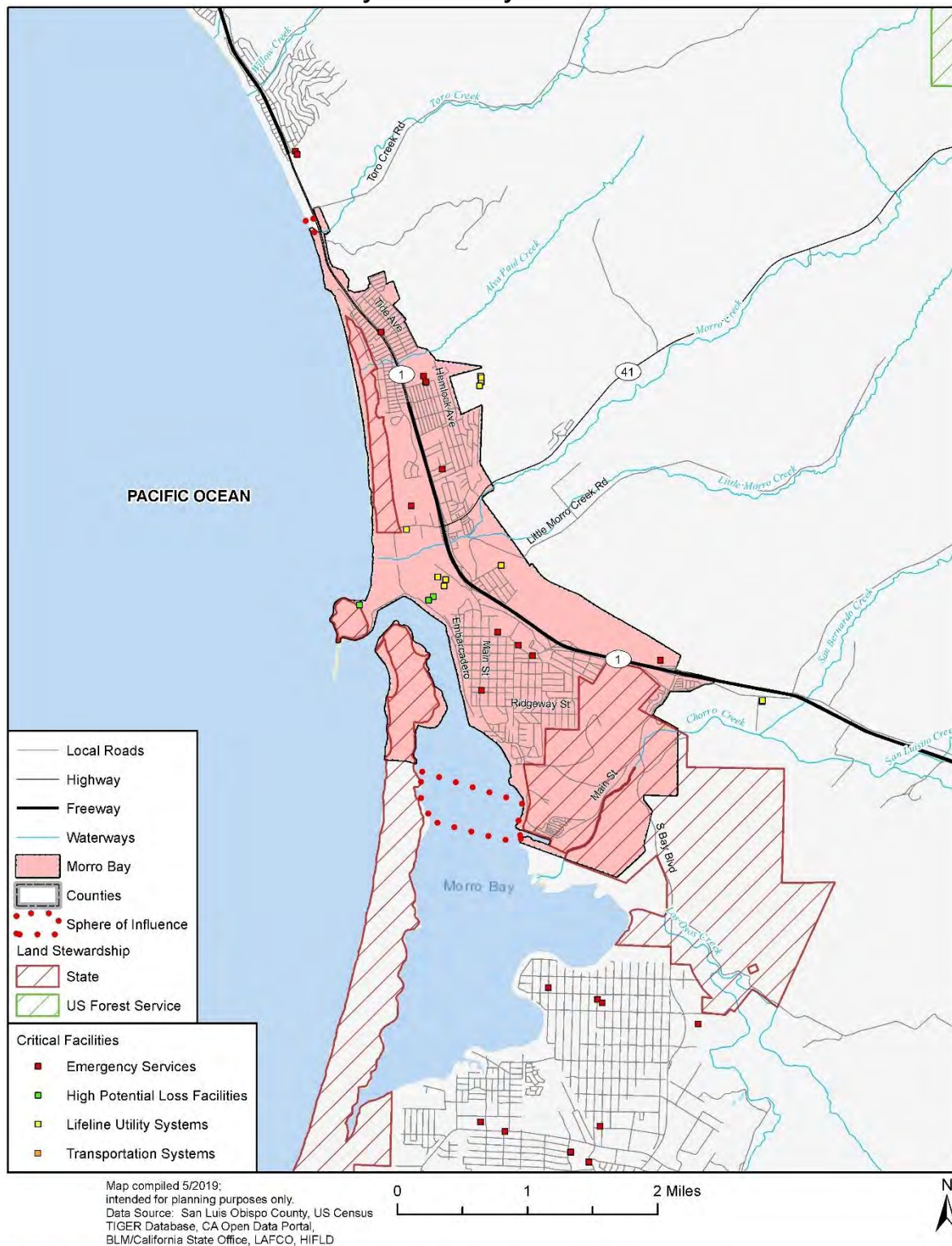
Facility Type	Name
Day Care Facilities	California State Preschool at Del Mar
	Capslo - Sequoia Child Development Center
	Central Coast Montessori
	Morro Bay United Methodist Children's Center
EMS Stations	Morro Bay Fire Department Station 1
	Morro Bay Fire Department Station 2
Fire Stations	Morro Bay Fire Department Station 1
	Morro Bay Fire Department Station 2
Local Law Enforcement	Morro Bay Police Department
Microwave Service Towers	--
Nursing Homes	Casa De Flores/ Bay Side Care Center
	Garden House
Public Schools	Del Mar Elementary
	Morro Bay High School
Wastewater Treatment Plant	Morro Bay/Cayucos Wastewater Treatment Plant
Power Plants	Dynegy, Inc.
Energy Commission Facilities	Morro Bay PG&E
Total	21

Source: San Luis Obispo County Planning and Building; LAFCO; HIFLD





Figure D.2 Critical Facilities in the City of Morro Bay





High Potential Loss Facilities

High potential loss facilities are considered critical facilities that present significant risks if damaged and include nuclear power plants, dams, and military installations. The City has one classified high potential loss facility: Dynergy's Morro Bay Power Plant.

Transportation Systems

The City of Morro Bay contains portions of Highway 41 and Highway 1, which are main sources of transportation access for the City and region. However, no critical facilities classified as part of essential/critical transportation systems were noted.

Lifeline Facilities

Lifeline Utility Systems include 2 Microwave Service Towers, 1 Wastewater Treatment Plant, and 1 Energy Commission Facilities for a total of 4 lifeline utility critical facilities.

Emergency Service Facilities

The City contains 13 Emergency Services facilities aimed at providing for the health and welfare of the entire community. These include day care facilities, emergency medical service stations, fire stations, local law enforcement stations, nursing homes, and schools as noted in Table D.8 and Table D.9.

Additional Critical Facilities

Additional Essential Infrastructures and Vulnerable Facilities to the district were noted by the Planning Team, which may or may not have been noted in the previous lists and tables. The 10 are summarized below along with their estimated replacement values (per the planning team input):

- City Hall - \$2.5 million
- Police Station - \$2.6 million
- Fire Station - \$5 million
- Water Treatment Plant - \$7.3 million
- Wastewater Treatment Plant - \$129 million
- Community Center - \$6.2 million
- Corporate Yard - \$1.6 million
- Harbor Department - \$4.5 million
- Public Works - \$1.25 million
- Veterans Hall - \$1.1 million

Historic and Cultural Resources

One of the most visually prominent historic natural landmarks immediately vulnerable to coastal hazards and sea level rise is Morro Rock. Morro Rock stands approximately 576 feet tall and was created from a volcanic plug. The area is a significant cultural and religious monument, as it was once the site of Chumash sacred rituals (City of Morro Bay 2018). Morro Rock is a protected State Historic Landmark (#821) that also provides nesting habitat for peregrine falcons, a previously endangered and currently fully protected species (Department of Fish and Wildlife 2019).

The City of Morro Bay has no registered federal historic sites; however, the State registered historical site, Morro Rock, is within the City Limits (State of California Office of Historic Preservation, 2019). Other historical sites of importance to the County of San Luis Obispo in Morro Bay are listed below.





- Filipino Landing - Coleman Park
- Morro Bay State Park - 20 State Park Road
- Morro Rock - Coleman Drive

Natural Resources

Natural resources are important to include in benefit-cost analyses for future projects and may be used to leverage additional funding for projects that also contribute to community goals for protecting sensitive natural resources. Awareness of natural assets can lead to opportunities for meeting multiple objectives. For instance, the Morro Bay coast is fronted by large sand dunes from Atascadero State Beach and continuing south through much of Montaña de Oro State Park that provide protection for developments located on terrace materials behind the sand dunes. The beach has widened about 250 feet near San Jacinto Avenue and almost 500 feet in front of Morro Bay High School in the past 50 years. This sandbar protects development in this region.

One of the most visually prominent historic natural landmarks immediately vulnerable to coastal hazards and sea level rise is Morro Rock. Morro Rock is a protected State Historic Landmark as mentioned above that also provides nesting habitat for peregrine falcons, a previously endangered and currently fully protected species.

Economic Assets

Morro Bay is the home of two of the largest agile manufactures in the Central Valley—PELCO (1,600 employees) and Anlin (350 employees). Loss of either employer would have the net result of almost 2,000 displaced employees and sales tax revenue in the millions of dollars.

D.3.2 Estimating Potential Losses

This section details vulnerability to specific hazards of medium or high significance, where quantifiable, noted by the Planning Team, and/or where it differs significantly from that of the overall County. Impacts of past events and vulnerability to specific hazards are further discussed below, though refer to Section 5 of the Base Plan for more details on the County's HIRA findings and hazard profiles.

Adverse Weather

Heavy rains and adverse storms occur in Morro Bay primarily during the late fall and winter but have a chance of occurring in every month of the year. According to information obtained from the Western Regional Climate Center (WRCC) the majority of precipitation is produced by storms during January and other winter months. Precipitation during the summer months is in the form of rain showers and is rare. Snowstorms, and hailstorms occur infrequently in San Luis Obispo County, and severe occurrences of any of these are very rare. Dense fog in Morro Bay reduces visibility making driving more dangerous during fog events. A fog advisory issued for San Luis Obispo County in October 2011 warned visibility could be as low as a quarter mile and reduce suddenly with denser patches. In March 2012 another fog advisory anticipated less than ¼ of normal visibility. Freeze events are a hazard to human populations as well as economic production. For example, historical records indicate in 1998 a winter cold air mass resulted in \$5.4 million in crop damage harming agricultural interests in the City.

Of specific concern for Morro Bay is the combination of high winds, winter storms and the resultant high surf. Coastal communities in the County face increased hazards to high wind and extreme wind storms. The surfing industry of Morro Bay, which attracts visitors and tourists, could be at risk due to the hazard to human safety in the event of increasing unsafe wind events.





The climate of the County is influenced by the effects of the Santa Lucia Range, the Pacific Ocean, and routine climate patterns such as El Niño. Extreme heat events can have severe impacts on human health and mortality, natural ecosystems, the agriculture sector and other economic sectors. Coastal communities including Morro Bay on average have lower temperatures compared to communities in inland areas of the County and may be less at risk to extreme temperatures, although they may be potentially less acclimatized to high temperatures if the event of occurrence.

Loss of life is uncommon but could occur during severe storms depending on secondary effects or impacts. Immobility can occur when roads become impassable due to dense fog, heavy rains causing flooding, and even downed trees (often referred to as hazardous trees due to the threat they pose). Overall, the Morro Bay planning team has rated adverse weather hazards as holding **High Significance**.

Earthquake and Liquefaction

The greatest threat to Morro Bay from a natural hazard is considered to be a significant earthquake (City of Morro Bay, 2012; City Planning Team). The northwest trending Cambria Fault zone is within the City limits of Morro Bay (US Quaternary Fault 2019). Within the surrounding area, the East Hausna, La Panza, Los Osos, Edna, Nacimiento, Rinconada, San Andres, and San Simeon- Hosgri Faults are considered to pose a potential hazard to the City in catastrophic and cascading effects (City of Morro Bay 2012). Earthquake-event associated impacts have occurred in Morro Bay in the past including a number of magnitude 5.0 to 7.7 earthquakes. The City's residential area consists predominantly of framed-type structures, which contain some material flexibility allowing the structures to withstand larger seismicity impacts in earthquake events than masonry buildings. Structure's weak areas are between sill plates and the foundation especially in homes constructed prior to 1950. In any earthquake, the primary consideration is saving lives. Time and effort must also be dedicated to providing for mental health by reuniting families, providing shelter to displaced persons, and restoring basic needs and services. Major efforts will be required to remove debris and clear roadways, demolish unsafe structures, assist in reestablishing public services and utilities, and provide continuing care and temporary housing for affected citizens.

In addition to being at risk of groundshaking as a result of a fault rupture, the City of Morro Bay is also susceptible to the effects of liquefaction. Much of the City has soils with a moderate risk for liquefaction. A majority of the City is underlain by beach and sand dune sediments and alluvial soils. Areas along the Embarcadero are known to have been filled in over the years with a variety of fill materials, and when combined with the high-water table in the area, these areas are of some concern. The number of active or potentially active fault systems throughout the County and historical records of past earthquakes in the area caused a probability of earthquake-related damage to the City of Morro Bay as medium. Table D.10 below summarizes the parcels at risk of liquefaction (moderate and high risk), broken up by parcel type, while Figure D.3 displays the City's liquefaction zones as a map. Overall, the City has over \$488 million of parcel improved values at risk from both risk categories, and a total of 4,193 exposed parcels.

A total of 17 critical facilities are found in either moderate or high-risk liquefaction zones in the City. These are listed in Table D.11 by facility type.

Earthquake and liquefaction hazards pose a **High Significance** for the City of Morro Bay.



**Table D.10 City of Morro Bay Liquefaction Risk by Parcel Type**

Parcel Type	Parcel Count	Improved Value
Moderate Risk		
Agricultural	1	\$4,833
Commercial	63	\$13,853,498
Government/Utilities	26	--
Other/Exempt/Miscellaneous	32	\$4,581,431
Residential	1,660	\$302,624,739
Multi-Family Residential	154	\$28,317,154
Mobile/Manufactured Homes	4	\$736,685
Residential: Other	7	\$11,659,175
Industrial	5	\$532,904
Vacant	17	\$3,839,339
TOTAL	1,969	\$366,149,758
High Risk		
Commercial	175	\$43,257,911
Government/Utilities	40	\$278,697
Other/Exempt/Misc.	78	\$10,658,702
Residential	1,428	\$278,017,365
Multi-Family Residential	342	\$85,310,401
Mobile/Manufactured Homes	8	\$1,605,910
Residential: Other	133	\$65,889,513
Industrial	3	\$224,660
Vacant	17	\$2,864,979
TOTAL	2,224	\$488,108,138
GRAND TOTAL (from both risk categories)	4,193	\$854,257,896

Source: San Luis Obispo County Planning and Building Dept., Assessor's Office, ParcelQuest, Wood Plc Parcel Analysis

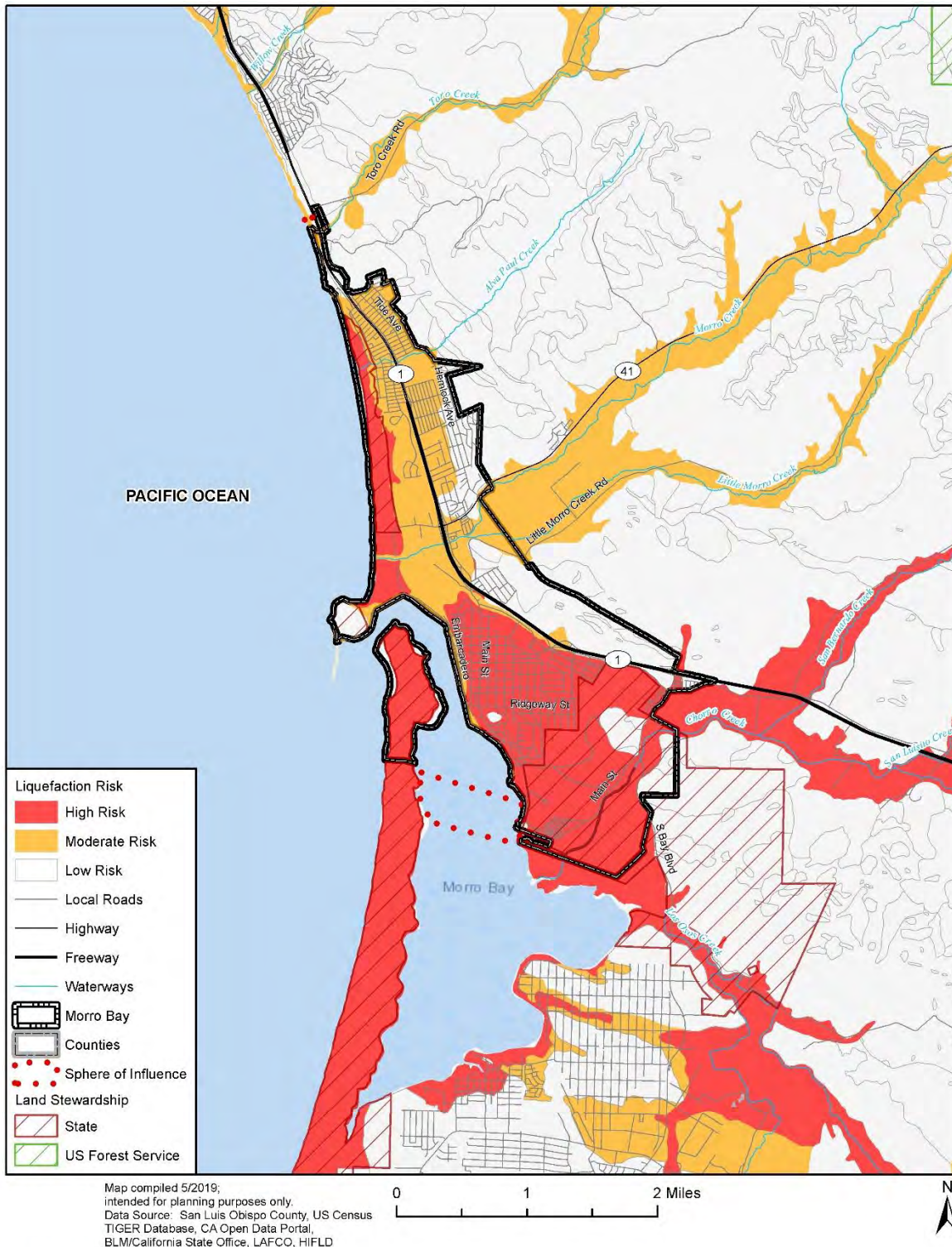


**Table D.11 Critical Facilities in Liquefaction Risk Areas in Morro Bay**

Facility Type	Facility Count
Moderate Risk	
Day Care Facilities	3
Emergency Medical Service Stations	1
Fire Stations	1
Microwave Service Towers	3
Public Schools	2
Wastewater Treatment Plants	1
Power Plants	1
Total	12
High Risk	
Day Care Facilities	1
Emergency Medical Service Stations	1
Fire Stations	1
Local Law Enforcement	1
Nursing Homes	1
Day Care Facilities	1
Total	6
GRAND TOTAL	18



Figure D.3 Liquefaction Risk in the City of Morro Bay





Flood

Historically, the City of Morro Bay has experienced severe flooding events that have resulted in extensive property damage. Areas with a history of flooding have a high probability of future flooding. Areas of concern include the following creek drainage systems: Chorro Creek, the Morro/Little Morro Creek convergence, No-Name Creek, Alva Paul Creek, Toro Creek, and San Bernardo Creek flow into and/or near the City. Chorro Creek is the largest and runs along the southern boundary of the City near two mobile home parks. Morro Creek runs parallel to Highway 41. These creeks present varying hazards and can block access to and egress from the City. When rainfall and surface run-off from a storm exceeds a drainage system's capacity to adequately channel and contain the water, flooding may occur. Potential flood areas include: The South Bay Boulevard area between Highway 1 and State Park Road; the area between Highway 41/Atascadero Road and Radcliff Avenue; low-lying sections of Island Street and Beachcomber; Highway 1, at the northern City limits; and, Highway 1 south of the City limit.

In Morro Bay, the most common type of flooding event is riverine flooding, also known as overbank flooding. Riverine floodplains range from narrow, confined channels in the steep valleys of mountainous and hilly regions, to wide, flat areas in plains and agricultural regions. The amount of water in the floodplain is a function of the size and topography of the contributing watershed, the regional and local climate, and land use characteristics. Flooding in steep, mountainous areas is usually confined, strikes with less warning time, and has a short duration. In addition to riverine flooding, Morro Bay is susceptible to flash flooding in smaller watersheds. Flash flood is a term widely used by experts and the general population, but there is no single definition or clear means of distinguishing flash floods from other riverine floods. Flash floods are generally understood to involve a rapid rise in water level, high velocity, and large amounts of debris, which can lead to significant damage that includes the tearing out of trees, undermining of buildings and bridges, and scouring of new channels. The intensity of flash flooding is a function of the intensity and duration of rainfall, steepness of the watershed, stream gradients, watershed vegetation, natural and artificial flood storage areas, and configuration of the streambed and floodplain. Urban areas are increasingly subject to flash flooding due to the removal of vegetation, installation of impermeable surfaces over ground cover, and construction of drainage systems. Wildland fires that strip hillsides of vegetation and alter soil characteristics may also create conditions that lead to flash floods and debris flows. Debris flows are may also create conditions that lead to flash floods and debris flows. Flood hazards have been determined to pose a **High Significance** risk to the City.

Values at Risk

A flood vulnerability assessment was completed during the 2019 update, following the methodology described in subsection 5.2 of the Base Plan. Table D.12 summarizes the values at risk in the City's 100-year, 500-year, and coastal (zone VE) floodplains. The table also details total values, loss estimates for each flood, and potential population at risk to each flooding zone. Figure D.4 shows the flooded parcels along with the FEMA flood hazard areas which cross the boundaries of Morro Bay.



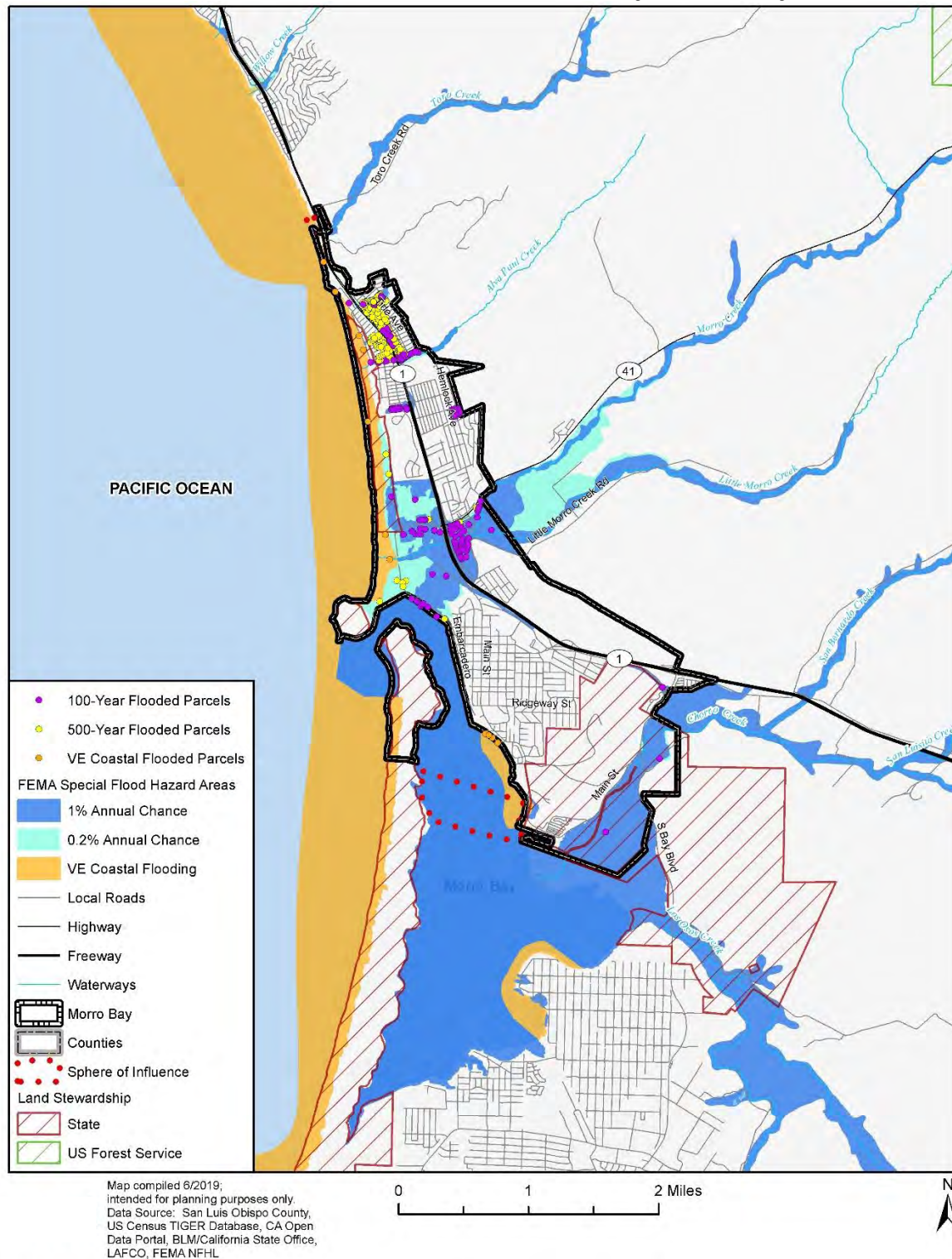
**Table D.12 City of Morro Bay Parcels in the Floodplains, by Parcel Type**

Parcel Type	Parcel Count	Improved Value	Content Value	Total Value	Loss Estimate	Population
100-Year Floodplain						
Agricultural	1	\$4,833	\$4,833	\$9,666	\$2,417	--
Commercial	21	\$6,671,912	\$6,671,912	\$13,343,824	\$3,335,956	--
Government/Utilities	18	\$96,077	--	\$96,077	\$24,019	--
Other/Exempt/ Miscellaneous	9	\$777,341	--	\$777,341	\$194,335	--
Residential	93	\$17,337,391	\$8,668,696	\$26,006,087	\$6,501,522	233
Multi-Family Residential	20	\$3,395,985	\$1,697,993	\$5,093,978	\$1,273,494	50
Mobile/Manufactured Homes	2	\$552,884	\$276,442	\$829,326	\$207,332	5
Residential: Other	2	\$2,881,233	\$1,440,617	\$4,321,850	\$1,080,462	5
Industrial	3	\$241,406	\$362,109	\$603,515	\$150,879	--
Vacant	11	\$3,456,946	--	\$3,456,946	\$864,237	--
TOTAL	180	\$35,416,008	\$19,122,601	\$54,538,609	\$13,634,652	294
500-Year Floodplain						
Commercial	5	\$550,272	\$550,272	\$1,100,544	\$275,136	--
Government/Utilities	4	--	--	\$0	\$0	--
Other/Exempt/ Miscellaneous	9	\$793,698	--	\$793,698	\$198,425	--
Residential	221	\$35,375,902	\$17,687,951	\$53,063,853	\$13,265,963	555
Multi-Family Residential	24	\$3,625,452	\$1,812,726	\$5,438,178	\$1,359,545	60
Vacant	1	\$7,290	--	\$7,290	\$1,823	--
TOTAL	264	\$40,352,614	\$20,050,949	\$60,403,563	\$15,100,891	615
Coastal (Zone VE) Floodplain						
Government/Utilities	9	--	--	\$0	\$0	--
Other/Exempt/ Miscellaneous	1	--	--	\$0	\$0	--
Vacant	1	\$5,724	--	\$5,724	\$2,862	--
TOTAL	11	\$5,724	\$0	\$5,724	\$2,862	-
GRAND TOTAL (all floodplains)	455	\$75,774,346	\$39,173,550	\$114,947,896	\$28,736,974	909

Source: San Luis Obispo County Planning and Building Dept., Assessor's Office, ParcelQuest, Wood Plc Parcel Analysis, FEMA NFHL



Figure D.4 Flooded Parcels in the FEMA Flood Hazard Areas, City of Morro Bay





Based on this analysis, the City of Morro Bay has significant assets at risk to the 100-year, 500-year, and VE coastal floods. There are 180 properties located within the 100-year floodplain for a total value of over \$54 million. An additional 264 improved parcels valued at over \$60 million fall within the 500-year floodplain, though the estimated losses would be about just over \$13.6 million for the 100-year flood and a little over \$15 million for the 500-year flood. With regards to coastal flooding, a total of 11 parcels are found to overlap with the VE coastal zone floodplain, for a total value of \$5,724 and a loss estimate of \$2,862.

The loss estimates for the 100- and 500-year flood events were calculated by taking 25% of the total values of the parcels, which in turn were found by adding up both improvement and content values for the parcels found to overlap with each of the floodplain layers, in GIS. The loss estimates for the coastal (VE zone) floodplain were found by taking 50% of the total value from the parcel totals, as it is predicted that coastal flooding may damage properties found within its path more adversely than regular riverine flooding (such as is assumed for the 100- and 500-year flooding events).

For more information on the asset calculations, parcel analysis, and loss estimation curves based on FEMA and Hazus derived standards refer to the Base Plan (e.g. subsection 5.2).

Limitations to the analysis performed and results shown: The analysis performed may include structures in the floodplains that are elevated at or above the level of the base-flood elevation, which will likely mitigate flood damage.

Population at Risk

Population at risk was estimated using the average persons per household values for the County of San Luis Obispo, based on the U.S. Census Bureau statistics. This figure is 2.51 persons per household. Then, this number was multiplied by the number of residential parcels found to overlap with the flooding layers in GIS, as it is assumed that no people live in non-residential parcels (e.g. commercial, government entities).

Insurance Coverage, Claims Paid, and Repetitive Losses

The City of Morro Bay joined the National Flood Insurance Program (NFIP) on February 15, 1974. NFIP Insurance data indicates that as of February 28, 2019, there were 175 flood insurance policies in force in the City with \$54,027,900 of coverage. Of the 175 policies, 152 were residential (143 for single-family homes, 4 for two to four-unit homes, and 5 for other residential properties) while 23 were nonresidential. There are 67 policies in A01-30 & AE zone and 7 policies in A zones. The remaining 101 are in B, C, and X zones.

There have been 17 historical claims for flood losses totaling \$243,005 that have been paid, out of 26 total cases submitted. According to the FEMA Community Information System there are no Repetitive Loss or Severe Repetitive Loss properties located in the jurisdiction.

Critical Facilities at Risk

Critical facilities are those community components that are most needed to withstand the impacts of disaster as previously described. There are seven critical facilities found in the 100-year floodplain in Morro Bay, and one critical facility (a public school) located in the City's 500-year floodplain. No critical facilities in Morro Bay are found to overlap with the coastal VE zone floodplain. It is particularly important to note that the critical facilities in the 500-year floodplain are all facilities that serve vulnerable populations and should be given special attention. Table D.13 below summarizes the critical facilities in the City's 100- and 500-year floodplains. The impact to the community could be great if these facilities are damaged or destroyed during a flood event.



**Table D.13 Critical Facilities in the FEMA Flood Hazard Areas, Morro Bay**

Floodplain	Critical Facility Type	Facility Count
100-year	Day Care Facilities	1
	Microwave Service Towers	3
	Wastewater Treatment Plant	1
	Energy Commission Facilities	1
	Power Plants	1
500-year	Public Schools	1
TOTAL		8

Source: San Luis Obispo County Planning and Building Dept., LAFCO, HIFLD, Wood Plc Parcel Analysis, FEMA NFHL

Landslides and Debris Flow

A well-documented history of landslide activity in the study area is present. Landslides activity is observable all along the Highway 1 corridor from San Luis Obispo, through the community of Morro Bay, and on north to San Simeon. In 1983, and again in 1995, very wet winters led to significant slope movement in the North Morro Bay area, north of Highway 41 and east of Highway 1; a number of slides caused the total destruction of homes, considerable damage to others, and damage to pipelines, driveways, and roadways. Numerous studies have documented unstable, landslide prone slopes in the Morro Bay area generally east of Highway 1 and north of Highway 4. A major landslide along the transportation routes in and out of the City of Morro Bay is a potential hazard to the heavily tourism-reliant economy.

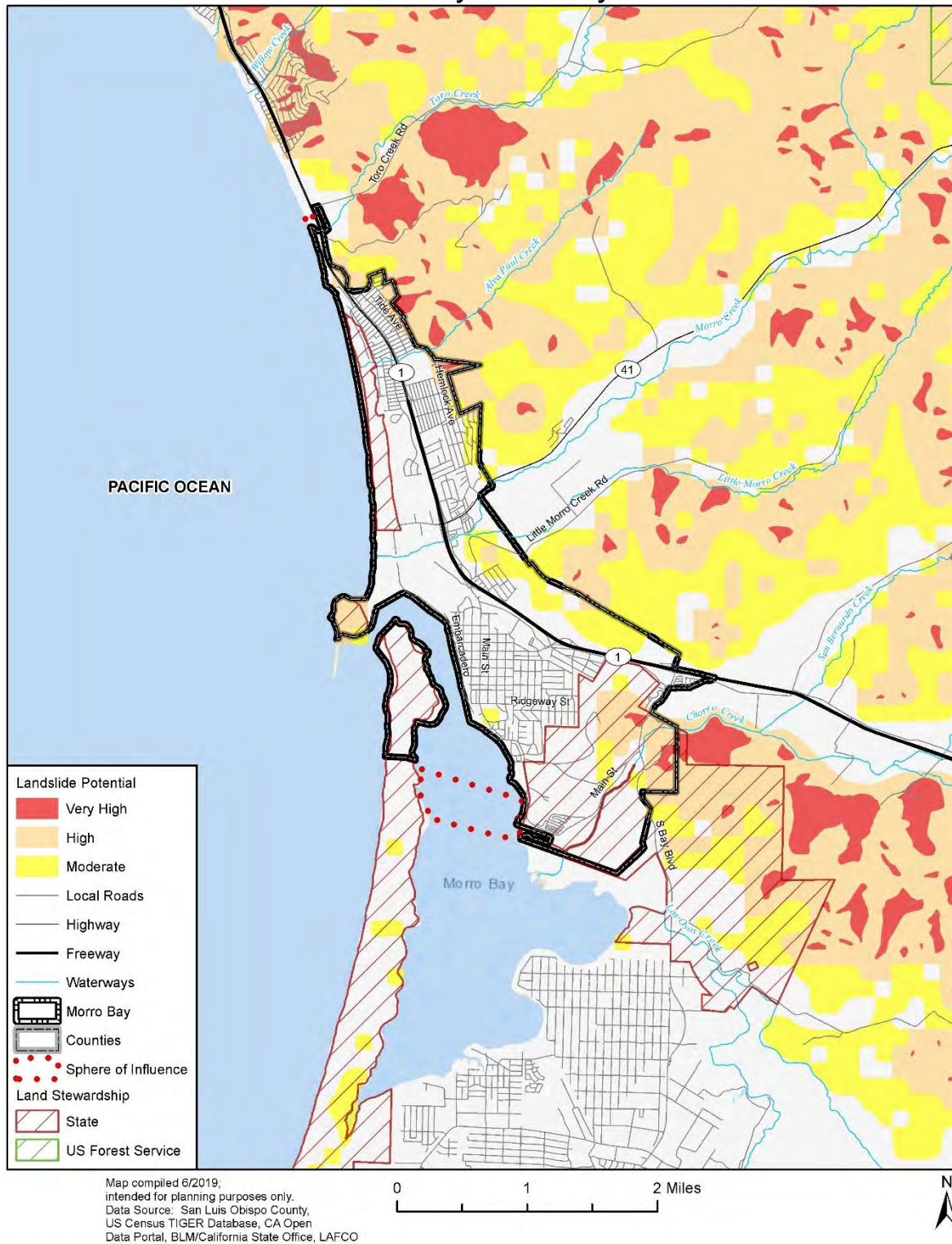
Table D.14 summarizes the parcel counts and values exposed to landslide potential areas in the City. Figure D.5 shows, in map form, where these landslide potential areas are in and near the City. One critical facility, a Microwave Service Tower, is located within the landslide potential areas in Morro Bay. Overall, landslide and debris flow hazards pose a **Medium Significance** risk to the City of Morro Bay.

Table D.14 City of Morro Bay Landslide Potential by Parcel Type

Property Type	Parcel Count	Improved Value
Moderate Landslide Potential		
Government/Utilities	4	--
Other/Exempt/Miscellaneous	1	\$10,173
Residential	361	\$93,272,094
Multi-Family Residential	5	\$1,137,135
Industrial	1	\$39,719
Vacant	6	\$643,597
TOTAL	378	\$95,102,718
High Landslide Potential		
Government/Utilities	3	--
Other/Exempt/ Miscellaneous	3	\$234,780
Residential	299	\$59,607,787
Multi-Family Residential	4	\$584,147
Vacant	1	\$136,000
TOTAL	310	\$60,562,714
GRAND TOTAL	688	\$155,665,432

Source: San Luis Obispo County Planning and Building Dept., LAFCO, Wood Plc Parcel Analysis

Figure D.5 Landslide Potential Areas in the City of Morro Bay





Coastal Storm/Coastal Erosion/Sea Level Rise

The entire 100-mile coastline of San Luis Obispo County and existing urban development and natural resources are potentially exposed to a range of coastal hazards, including coastal storms and coastal erosion. Such hazards are projected to become more severe when combined with sea level rise (see subsection 5.3.7 - Coastal Storm and Erosion). The City's State Park, harbor, and developed and undeveloped coastal bluff trails are sources of community enhancement and the tourism-driven economy. Coastal hazards have the potential to harm the economic stability of the City. Additional areas of vulnerabilities include the low-lying development and development on higher elevated terraces in close proximity to beaches and sand dunes. The northern beach portions of Morro Bay are protected from serious erosion by a wide gentle slope, which is backed by a low series of small sand dunes. Erosion may occur each winter with the onslaught of large winter surf, however natural process returns the sand to the beach during the summer months. The infrastructure of the harbor entrance is a different matter. Large winter storms may have serious impacts on the jetties and breakwater that are an integral part of maintaining a safe navigable entrance to the harbor. The southern portions of the City and the Bay itself are protected by a wide beach and large series of tall sand dunes.

Sea level rise (SLR) has the potential to increase the frequency and severity of coastal hazards affecting coastal assets and resources in the City of Morro Bay. The City is susceptible to coastal hazards such as inundation, flooding, and bluff/dune erosion associated with extreme waves and water levels. Exposure of a coastal asset or resource to a hazard may result in varying impacts, depending on its function and its resiliency, which is its ability to withstand and recover from these events as outlined in the 2018 sea level rise adaption strategy report. These coastal storm, coastal erosion, and sea level rise hazards have been rated by the Planning Team as holding **High Significance** in the City.

As part of the 2019 HMP planning effort, a sea level rise risk assessment was completed to determine how sea level rise may affect coastal jurisdictions and critical facilities and how coastal flooding might be exacerbated in the future. Table D.15 lists the critical facilities that would be affected by sea level rise. There is no risk until the 300 cm scenario; facilities identified include the Morro Bay High School, and the Morro Bay/Cayucos wastewater treatment plant, the power plant and an PG&E substation. Table D.16 and Table D.17 summarize the other properties at risk of inundation by sea level rise and sea level rise combined with a 1% annual chance coastal flood. The area of inundation by sea level rise and sea level rise combined with the 1% coastal flood are shown in Figure D.6 and Figure D.7, respectively. See subsection 5.3.7 Coastal Storm/Coastal Erosion/Sea Level Rise in the base plan for more details on the scenarios and data sources used for this analysis.

Table D.15 Critical Facilities Inundated by Sea Level Rise

Sea Level Rise	Critical Facility Type	Facility Count
300-cm	Microwave Service Towers	3
	Wastewater Treatment Plant	1
	Energy Commission Facilities	1
	Power Plants	1
	Schools	1
TOTAL		7



**Table D.16 Properties Inundated by Sea Level Rise and Sea Level Rise with 1% Annual Chance Flood**

Property Type	25-cm SLR	75-cm SLR	300-cm SLR	25-cm SLR w/ 1% Flood	75-cm SLR w/ 1% Flood	300-cm SLR w/ 1% Flood
Commercial	--	--	12	--	1	12
Government/Utilities	1	1	19	1	3	19
Other/Exempt/Misc.	--	--	6	--	--	9
Residential	--	1	12	1	1	76
Residential: Other	--	--	3	--	1	4
Vacant	1	1	3	1	1	4
Total	2	3	55	3	7	124

Source: Wood analysis with USGS CoSMoS 3.1 data

Table D.17 Improved Values of Properties Inundated by Sea Level Rise and Sea Level Rise with 1% Annual Chance Flood

Property Type	25-cm SLR	75-cm SLR	300-cm SLR	25-cm SLR w/ 1% Flood	75-cm SLR w/ 1% Flood	300-cm SLR w/ 1% Flood
Commercial	--	--	\$4,441,799	--	\$800,000	\$4,441,799
Government/Utilities	--	--	--	--	--	--
Other/Exempt/Misc.	--	--	\$74,906	--	--	\$74,906
Residential	--	\$42,463	\$3,930,417	\$42,463	\$42,463	\$30,817,911
Residential: Other	--	--	\$7,707,961	--	--	\$9,981,210
Vacant	\$5,724	\$5,724	\$3,312,145	\$5,724	\$5,724	\$3,337,145
Total	\$5,724	\$48,187	\$19,467,228	\$48,187	\$4,920,431	\$48,652,971

Source: Wood analysis with USGS CoSMoS 3.1 data



Figure D.6 Morro Bay Sea Level Rise Scenario Analysis: Tidal Inundation Only





Figure D.7 Morro Bay Sea Level Rise Scenario Analysis: Tidal Inundation and 1% Annual Chance Flood





Tsunami and Seiche

Tsunami inundation poses a risk to all coastal communities in the County of San Luis Obispo including Morro Bay. Offshore faults and related seismic activity could cause a tsunami event off the coast of Morro Bay, even if the faults are thousands of miles away. Historically, significant tsunamis on the Central Coast of California have been infrequent. Few incidences have been recorded and the historical record is not extensive enough to develop accurate reoccurrence predictions. The potential tsunami hazard for the City's coastal areas is greatest for those communities or portions of communities that are located at or below 50 feet above mean sea level. In general, much of the Coast of Morro Bay is protected from tsunami hazards by wide beaches, coastal dunes, or sea cliffs that provide protection for coastal developments. Coastal developments most vulnerable to the tsunami hazards are those located near mouths of streams that drain into the Pacific Ocean. The potential for damage to coastal structures would likely increase if the tsunami event were to coincide with a high tide, storm related waves, or large winter storm runoff. Tsunami hazards are predicted in the following locations within the City of Morro Bay: Morro Creek, Alva Paul Creek, Chorro Creek, Atascadero Beach, the harbor area, and Embarcadero.

A GIS analysis performed on the parcels and the tsunami inundation layers determined that 332 parcels with an estimated loss value of over \$145 million are at risk of this hazard. See Table D.18 for a summary of the parcel count, improved values, content values, total values, loss estimates (which in this case equal the total values), and population at risk of tsunami inundation. Figure D.8 displays these tsunami inundation areas on the coast of the City.

Critical Facilities were also overlaid with the tsunami inundation layers in GIS. This analysis yielded a total of seven facilities found at risk. These are listed in Table D.18 Tsunami and Seiche hazards have been rated by the City's planning team as holding **High Significance**.

Table D.18 Parcels in the Tsunami Inundation Zones in the City of Morro Bay

Property Type	Parcel Count	Improved Value	Content Value	Total Value	Loss Estimate	Population
Commercial	19	\$5,909,664	\$5,909,664	\$11,819,328	\$11,819,328	--
Government/ Utilities	42	\$96,077	--	\$96,077	\$96,077	--
Other/Exempt/ Miscellaneous	21	\$783,694	--	\$783,694	\$783,694	--
Residential	236	\$76,829,089	\$38,414,545	\$115,243,634	\$115,243,634	592
Mobile/ Manufactured Homes	1	\$257,130	\$128,565	\$385,695	\$385,695	3
Residential: Other	3	\$8,883,394	\$4,441,697	\$13,325,091	\$13,325,091	8
Industrial	3	\$241,406	\$362,109	\$603,515	\$603,515	--
Vacant	7	\$3,361,253	--	\$3,361,253	\$3,361,253	--
TOTAL	332	\$96,361,707	\$49,256,580	\$145,618,287	\$145,618,287	602

Source: San Luis Obispo County Planning and Building Dept., LAFCO, Wood Plc Parcel Analysis, CA Department of Conservation



**Table D.19 Critical Facilities in the Tsunami Inundation Zones, City of Morro Bay**

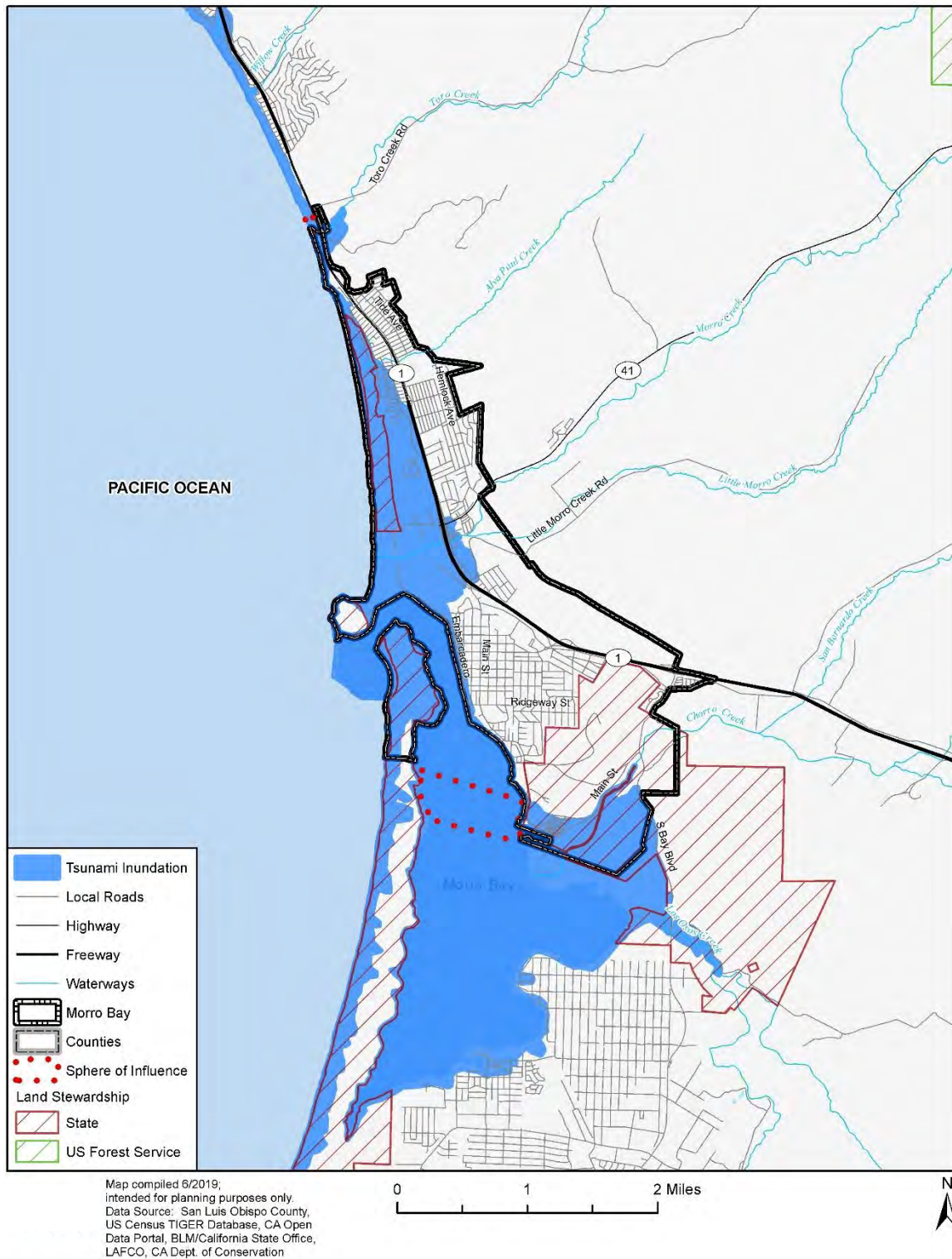
Property Type	Parcel Count
Wastewater Treatment Plant	1
Public Schools	1
Energy Commission Facilities	1
Power Plants	1
Microwave Service Towers	2
TOTAL	6

Source: San Luis Obispo County Planning and Building Dept., LAFCO, HIFLD, Wood Plc Parcel Analysis, CA Department of Conservation





Figure D.8 **Tsunami Inundation Areas in the City of Morro Bay**





Wildfire

Weather plays a key factor in the wildland fire potential in Morro Bay. Rain fall occurs primarily between the months of November and April, and ranges between 20 to 25 inches per year. Summers are typically cool with fog and or high humidity the norm. Wind in the area, a key factor in spread, is quite predictable and is usually moisture laden due to the close proximity of the ocean. Fall season typically shows drier and warmer days, which combine with the lack of rainfall to increase the fire hazard threat. Despite the temperate climate in the City, the lack of rainfall can lead to an increase in fire hazard threat. Fuel sources in the Morro Bay area are diverse, including everything from dead tree leaves, twigs, and branches to dead standing trees, live trees, brush, and cured grasses. The type of prevalent fuel directly influences the behavior of wildfire, and the City's planning team has identified hazardous trees as potentially increasing fuel sources.

Wildland fires can be classified as urban fires, interface or intermix fires, or prescribed fires. The following three factors contribute significantly to wildland fire behavior:

Topography: As slope increases, the rate of wildland fire spread increases. South-facing slopes are also subject to more solar radiation, making them drier and thereby intensifying wildland fire behavior. However, ridge tops may mark the end of wildland fire spread because the speed at which a fire moves downhill is much slower, sometimes resulting in a natural fire barriers.

Fuel: The type and condition of vegetation plays a significant role in the occurrence and spread of wildland fires. Certain types of plants are more susceptible to burning or will burn with greater intensity. Dense or overgrown vegetation increases the amount of combustible material available to fuel the fire (referred to as the "fuel load"). The ratio of living to dead plant matter is also important. The risk of fire is increased significantly during periods of prolonged drought as the moisture content of both living and dead plant matter decreases. The fuel's density, both horizontally and vertically, is also an important factor.

Weather: The most variable factor affecting wildland fire behavior is weather. Temperature, humidity, wind, and lightning can affect chances for ignition and spread of fire. Extreme weather, such as high temperatures and low humidity, can lead to extreme wildland fire activity. By contrast, cooling and higher humidity often signals reduced wildland fire occurrence and easier containment.

The frequency and severity of wildland fires is also dependent upon other hazards, such as lightning, drought, and infestations (such as the 2003 firestorm damage to southern California alpine forests by the pine bark beetle). If not promptly controlled, wildland fires may grow into a large scale emergency or disaster. Even small fires can threaten lives and resources and destroy improved properties. The indirect effects of wildland fires can be catastrophic. In addition to stripping the land of vegetation and destroying forest resources, large, intense fires can harm the soil, waterways, and the land itself. Soil exposed to intense heat may lose its capability to absorb moisture and support life. Exposed soils erode quickly and enhance siltation of rivers and streams, thereby enhancing flood potential, harming aquatic life, and degrading water quality. Lands stripped of vegetation are also subject to increased debris flow hazards, as described above.

Wildland fires are common occurrences in San Luis Obispo County. The most significant wildland fires within the county have been located in the northern division of the Los Padres National Forest. In 1994, a 49,000-acre fire burned forestland from the western portion of Morro Bay to Morro Bay. In 1996, 106,000 acres burned in the Machesna Mountain Wilderness area southeast of the City before the fire was contained. A little over one year later, a 30,000-acre wildland fire burned in forestland in the southern portion of San Luis Obispo County. The





largest historical wildfire in the City limits of Morro Bay was contained to approximately seven acres. The open lands in and adjoining the City have been categorized by the California Department of Forestry and Fire Protection's Fire and Resource Assessment Program (FRAP), as being of a Medium Fire Hazard. The areas that are at risk from a large-scale wildland fire are mostly located on the edge of the City limits. These "fringe" areas are where there is the most potential for a wild fire to cause significant property damage, however most of these lands are grazed by cattle and the fuel loads are kept to a minimum. The neighborhoods bordering the Morro Bay State Park and Black Hill area also constitute wildfire urban interface problem.

Following the methodology described in the wildfire hazard subsection 5.3.15 Wildfire of the Base Plan, along with the GIS parcel analysis discussed in more detail under subsection 5.2 Asset Summary, a wildfire vulnerability analysis for the City of Morro Bay was completed. The assessment was performed using GIS, and results indicate that there were neither parcels nor critical facilities in wildfire severity hazard zones within the boundaries of the City of Morro Bay. However, wildfire hazards have been rated by the City's planning team as holding **High Significance** based on the community's experience and historical evidence.

Human Caused: Hazardous Materials

The City of Morro Bay is at risk of both hazardous material incidents at fixed facilities as well as materials being transported on Highway 101 which traverse the City's jurisdiction and is considered a major transportation route for shipping hazardous materials. An incident along this Highway would expose a significant portion of the City's population as well as the local economy if Highway 101 was to be shut down for an extended period of time.

The Cal OES Warning Center reports 266 hazardous materials incidents in the City of Morro Bay from 1994 through October 24, 2018; as noted in subsection 5.3.16 of the Base Plan, this likely excludes a large number of unreported minor spills. These over two hundred incidents constitute 15% of the hazardous materials incidents reported countywide during the same time frame, which in turn averages to roughly 10.6 incidents per year in or near Morro Bay. As noted in subsection 5.3.16, only around 6% of reported hazardous materials incidents result in injuries, fatalities, or evacuations. Although there are no significant hazardous materials facilities located in the City, Morro Bay sits within the Emergency Planning Zone for the Diablo Canyon Nuclear Power Plant. Overall, the planning team has classified Hazardous Materials as holding **Medium Significance** for the jurisdiction.

D.4 Capability Assessment

Capabilities are the programs and policies currently in use to reduce hazard impacts or that could be used to implement hazard mitigation activities. This capability assessment is divided into five sections: regulatory mitigation capabilities, administrative and technical mitigation capabilities, fiscal mitigation capabilities, mitigation outreach and partnerships, and other mitigation efforts.

To develop this capability assessment, the jurisdictional planning representatives used a matrix of common mitigation activities to inventory which of these policies or programs were in place. The team then supplemented this inventory by reviewing additional existing policies, regulations, plans, and programs to determine if they contributed to reducing hazard-related losses.

During the plan update process, this inventory was reviewed by the jurisdictional planning representatives and Wood consultant team staff to update information where applicable and note ways in which these capabilities have improved or expanded. In summarizing current capabilities and identifying gaps, the jurisdictional planning representatives also considered their ability to expand or improve upon existing policies and programs as





potential new mitigation strategies. The City of Morro Bay's updated capabilities are summarized below in Table D.20.

D.4.1 Regulatory Mitigation Capabilities

Table D.20 City of Morro Bay Regulatory Mitigation Capabilities

Regulatory Tool	Yes/No	Comments
General plan	Yes	Land Use Element, Circulation Element, Housing Element, Noise Element, Safety Element, Conservation and Open Space Element, Access and Recreation Element, and Visual Resources and Scenic Highway Element
Zoning ordinance	Yes	Title 17: Zoning Regulations of the City of Morro Bay Code
Subdivision ordinance	Yes	Title 16: Subdivisions
Growth management ordinance	Yes	Ordinance No. 266
Floodplain ordinance	Yes	Chapter 14.72 General Provisions
Other special purpose ordinance (stormwater, water conservation, wildfire)	Yes	Chapter 14.48 Building Regulations: Illicit Discharge and Stormwater Management Control, Chapter 13.04.345 Mandatory Water Conservation Requirements Ordinance under Emergency Water Levels
Building code	Yes	Chapter 14.03
Fire department ISO rating	Yes	Class 5
Erosion or sediment control program	Yes	Erosion and Sediment Control Manual
Stormwater management program	Yes	Chapter 14.48- Illicit Discharge and Stormwater Management Control
Site plan review requirements	Yes	Chapter 17. 40 Planned Development Overlay Zone
Capital improvements plan	No	
Economic development plan	Yes	Morro Bay Economic Development Roadmap
Local emergency operations plan	Yes	Chapter 8.08.080- Emergency Plan, County EOP (2016)
Other special plans	Yes	E.g., Downtown Waterfront Strategic Plan, Local Coastal Plan – More online
Flood Insurance Study or other engineering study for streams	Yes	2017
Elevation certificates (for floodplain development)	Yes	Section 14.72.020- Provisions for Flood Hazard Reduction

D.4.2 Administrative/Technical Mitigation Capabilities

Table D.21 identifies the personnel responsible for activities related to mitigation and loss prevention in Morro Bay.



**Table D.21 City of Morro Bay Administrative/Technical Mitigation Capabilities**

Personnel Resources	Yes/No	Department/Position
Planner/engineer with knowledge of land development/land management practices	Yes	Community Development
Engineer/professional trained in construction practices related to buildings and/or infrastructure	Yes	Community Development Public Works
Planner/engineer/scientist with an understanding of natural hazards	Yes	Planning/Fire Department
Personnel skilled in GIS	Yes	Technology
Full time building official	Yes	Community Development
Floodplain manager	Yes	Public Works
Emergency manager	Yes	City Manager
Grant writer	Yes	Administration Services
GIS Data Resources (Hazard areas, critical facilities, land use, building footprints, etc.)	Yes	Public Works
Warning systems/services (Reverse 9-11, outdoor warning signals)	Yes	Dispatch

D.4.3 Fiscal Mitigation Capabilities

In order to achieve the goals and objectives of the Mitigation Strategy, one or more of the following funding sources could be utilized: federal and state entitlements and grants, 58 general fund, sales and property taxes, infrastructure user fees, impact fees, and new development impact fees. The City of Morro Bay has the necessary budgetary tools and practices in place to facilitate handling appropriate funds; however, funding sources are very limited. Table D.22 identifies financial tools or resources that the City could potentially use to help fund mitigation activities.

Table D.22 City of Morro Bay Fiscal Mitigation Capabilities

Financial Resources	Accessible/Eligible to Use (Yes/No)
Community Development Block Grants	Yes
Capital improvements project funding	Yes
Authority to levy taxes for specific purposes	Yes
Fees for water, sewer, gas, or electric services	Yes
Impact fees for new development	Yes
Incur debt through general obligation bonds	Yes
Incur debt through special tax bonds	Yes
Incur debt through private activities	No
Withhold spending in hazard prone areas	No





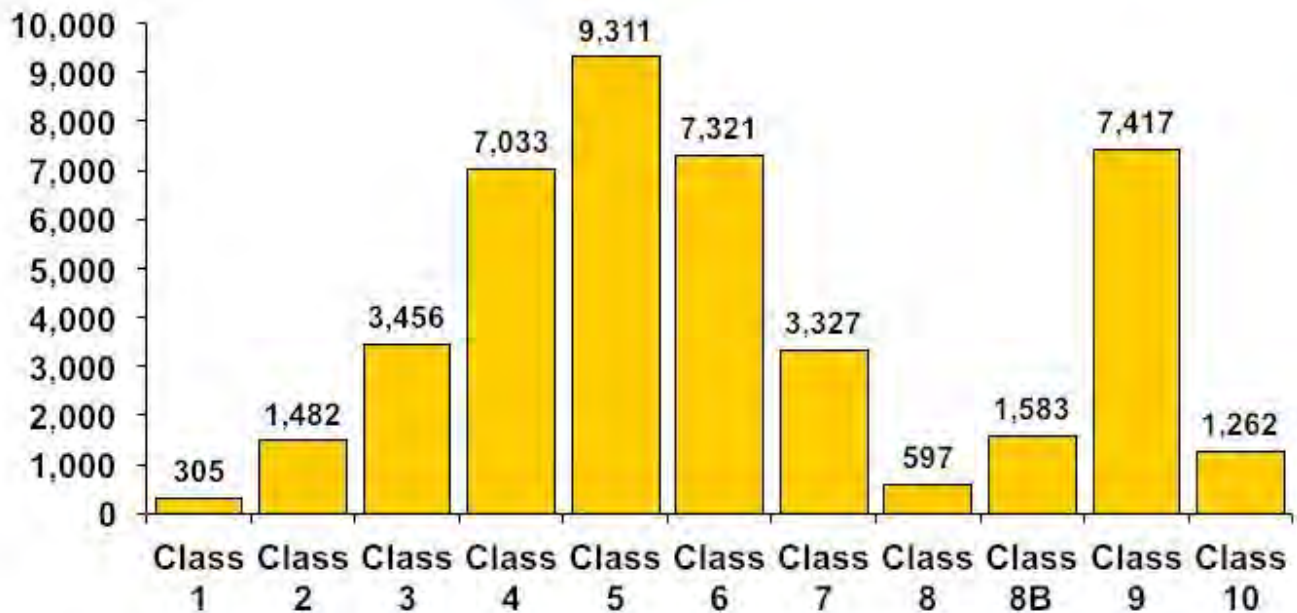
D.4.4 Mitigation Outreach and Partnerships

The County of San Luis Obispo conducted community outreach within the City limits to receive feedback from stakeholders on outlined mitigation strategies within the SLO County Multi-Jurisdictional Hazard Mitigation Plan. The City of Morro Bay maintains partnerships with the local Morro Bay, Fire, Police, and Harbor Departments to provide daily, long-term services required under the LHMP and the SLO County Multi-Jurisdictional Hazard Mitigation Plan. The City's fire prevention and suppression services are provided by the City of Morro Bay Fire Department (MBFD), a fire and emergency service organization. As of June 2019, MBFD is staffed by 11 full time professional firefighters, 16 part time reserve firefighters, and 1 administrative assistant. The City of Morro Bay Police Department (MBPD) provides law enforcement services for the City. As of June 2019, MBPD is staffed at 17 sworn officers including the Chief and Commander and one reserve officer, for a ratio of 1.7 officers per 1,000 residents. The Harbor Department of the City of Morro Bay provides a high level of service in community education (water safety programs), public outreach, and community relations for boaters, beach users, and waterfront visitors. The Harbor Department is also involved with resource management for the City's beaches and natural resources including coordination with state and federal regulatory agencies.

D.4.5 Other Mitigation Efforts

The Morro Bay Fire Department continuously reviews its current Insurance Service Office (ISO) Class 3 rating. The ratings calculate how well-equipped fire departments are to put out fires in that community. The ISO provides this score, often called the "ISO fire score," to homeowners insurance companies. The insurers then use it to help set homeowners insurance rates. The more well-equipped your fire department is to put out a fire, the less likely your house is to burn down. And that makes your home less risky, and therefore less expensive, to insure.

Countrywide





D.4.6 Opportunities for Enhancement

Based on the capability assessment, the City of Morro Bay has several existing mechanisms in place that help to mitigate hazards. There are also opportunities for the City to expand or improve on these policies and programs to further protect the community. Future improvements may include providing training for staff members related to hazards or hazard mitigation grant funding in partnership with the County and Cal OES. Additional training opportunities will help to inform City staff members on how best to integrate hazard information and mitigation projects into their departments. Continuing to train City staff on mitigation and the hazards that pose a risk to the City of Morro Bay will lead to more informed staff members who can better communicate this information to the public.

D.5 Mitigation Strategy

D.5.1 Mitigation Goals and Objectives

The City of Morro Bay's Hazard Mitigation Planning Group determined the goals from the 2012 Local Hazard Mitigation Plan continue to be appropriate for this plan update. The Group coordinated with the Fire Chief and the City Engineer to develop the following set of goals, objectives and mitigation actions for review by the City Council. The following are the City of Morro Bay's 2019 mitigation goals:

Goal 1. Promote disaster-resiliency for future development to help them become less vulnerable to hazards.

Objective 1.1 Facilitate the development (or updating) of the City's Comprehensive Plan, City General Plans, and zoning ordinances to limit (or ensure safe) development in hazard areas.

Objective 1.2: Facilitate the incorporation and adoption of building codes and development regulations that encourage disaster resistant design.

Objective 1.3: Facilitate consistent implementation of plans, zoning ordinances, and building and fire codes.

Goal 2. Enhance hazard mitigation coordination and communication.

Objective 2.1: Address data limitations identified in Hazard Profiling and Risk Assessment. Provide education to key stakeholders and the public to increase awareness of hazards and opportunities for mitigating hazards.

Objective 2.2: Increase awareness and knowledge of hazard mitigation principles and practice among local government officials.

Objective 2.3 : Participate in initiatives that have mutual hazard mitigation benefits for the City.

Objective 2.4: Encourage other organizations, within the public, private, and non-profit sectors, to incorporate hazard mitigation activities into their existing programs and plans.

Goal 3. Build and support local capacity and commitment to minimize the City's vulnerability to potential hazards.

Objective 3.1 Improve existing capabilities to warn the public of emergency situations.

Objective 3.2 Develop programs to enhance the safety of residents, students, and staff within the community.





Objective 3.3 Continue to support the applicable City departments in their ability to respond effectively to major emergencies.

Goal 4. Minimize the level of damage and losses to people as well as existing and future critical facilities and infrastructure due to flooding.

Objective 4.1 Implement policies, procedures, and regulations to reduce the exposure to flood hazards

Objective 4.2 Protect the improved property, natural resources, and life that are vulnerable to flood hazards.

Objective 4.3 Reduce the vulnerability of community assets particularly critical facilities located within the 100-year floodplain.

Objective 4.4 Continue to support and fund creek maintenance activities such as monitoring modifying property owners of hazardous conditions, as well as performing routine creek maintenance as needed and permitted by the California Department of Fish and Game.

Goal 5. Minimize the level of damage and losses to people, existing and future critical facilities and infrastructure to tsunamis.

Objective 5.1 Develop a comprehensive approach to reducing the level of damage and losses resulting from tsunami events.

Objective 5.2 Protect the improved property, natural resources, and life vulnerable to a tsunami event.

Goal 6. Minimize the level of damage and losses to people and existing and future critical facilities and infrastructure due to wildland fires.

Objective 6.1 Develop a comprehensive approach to reducing the level of damage and losses due to wildland fires.

Objective 6.2 Protect the improved property, natural resources, and life vulnerable to the effects of wildland fires.

Objective 6.3 Educate the public about wildland fire dangers and mitigation measures.

Goal 7. Minimize the level of damage and losses to people and existing and future critical facilities and infrastructure due to earthquakes.

Objective 7.1 Develop a comprehensive approach to reducing the level of damage and losses due to earthquakes.

Objective 7.2 Protect the improved property, natural resources, and life vulnerable to the effects of earthquakes.

Goal 8. Minimize the level of damage and losses to people and existing and future critical facilities and infrastructure due to the accidental spills and releases of Hazardous Materials.

Objective 8.1 Support the existing comprehensive approach to reducing the level of damage and losses due to the accidental spills and releases of hazardous materials.

Objective 8.2 Protect the improved property, natural resources, and life vulnerable to the accidental spills and releases of hazardous materials.





Goal 9. Minimize the level of damage and losses to people and existing and future critical facilities and infrastructure due to biological agent threats.

Objective 9.1 Develop a comprehensive approach to minimizing the loss of human life and livestock and agricultural products due to biological agent threats.

Continued Compliance with the National Flood Insurance Program

The City has been an NFIP participating community since 1979. In addition to the mitigation actions identified herein the City will continue to comply with the NFIP. This includes ongoing activities such as enforcing local floodplain development regulations, including issuing permits for appropriate development in Special Flood Hazard Areas, and ensuring that this development mitigated in accordance with the regulations. This will also include periodic reviews of the floodplain ordinance to ensure that it is clear and up to date, and reflects new or revised flood hazard mapping.

D.5.2 Completed 2006 Mitigation Actions

During the 2019 planning process the City of Morro Bay Planning Team reviewed all the mitigation actions from the 2006 LHMP. The review indicated the City has completed eleven mitigation actions since 2006, and has made continued progress in implementing mitigation projects and building the community's resilience to disasters. The completed actions have reduced vulnerability to hazards and increased local capability to implement additional mitigation actions. Table D.23 below show the mitigation actions that have been completed since 2006.



**Table D.23 City of Morro Bay Completed Mitigation Actions**

Action ID	Corresponding Hazard(s)	Mitigation Action	Lead Agency	Priority	Actions Status Notes
3.B	Multi	Support the development of the County Regional Community Emergency Response Team (CERT) in the local areas.	Fire Department	Medium	completed
3.D	Multi	Task the Disaster Council with developing a Continuity of Operations Plan (COOP) for the City	Fire Department	High	completed
4.B	Flood	Maintain compliance with the National Flood Insurance Program (NFIP) requirements	Community Development/ Public Safety	Medium	continuous
4.C	Flood	Continue to participate and support the San Luis Resource Conservation District (RCD) County Flood Control Zone	Admin/ Community Development	High	continuous
4.D	Flood	Restrict construction of essential service facilities in the 100-year floodplain areas	Community Development	Medium	completed
5.D	Tsunami	Restrict construction of essential service facilities in tsunami inundation zone	Community Development	Medium	completed
6.C	Wildfire	Continue to enforce codes and ordinances that eliminate the use of wood shake roofs	Community Development Fire Department	Medium	continuous
6.D	Wildfire	Develop codes and ordinances that require fire sprinkler systems in all new structures built in the wildland urban interface areas of the City	Community Development Fire Department	Medium	continuous
7.B	Earthquake	Require property owners of URM buildings to post-approved signage on site	Public Safety	High	completed
8.A	Hazardous Materials	Establish a goal of sending one fire department employee every three years through the California Specialized Training Institute Hazardous Materials Specialist program so that they may become a member of the county's hazardous materials response team	Fire Department	Medium	completed
9.D	Biological Agents	Support establishment of a Vector Control District in San Luis Obispo County	Admin/Fire Department	Medium	continuous





D.5.3 Mitigation Actions

The Planning Team for the City of Morro Bay identified and prioritized the following future mitigation actions based on the conducted risk assessment (see Table D.24). Background information and information on how each action will be implemented and administered, such as ideas for implementation, responsible office, potential funding, estimated cost, and timeline are also included. Actions were prioritized using the process described in subsection 7.2.1 of the Base Plan. Actions with an asterisk (*) are those that mitigate losses to future development.



**Table D.24 City of Morro Bay 's Mitigation Action Plan**

ID	Hazard(s) Mitigated	Description/Background/Benefits	Lead Agency and Partners	Cost Estimate	Potential Funding	Priority	Timeline	Status/ Implementation Notes
MB.1	Adverse Weather, Coastal Erosion/Sea Level Rise, Earthquake, Flood, Landslides, Tsunami, Wildfire	Educate the planning staff, City administrative staff and elected officials on the importance of keeping up to date on trends and developments in ,disaster preparedness. Attendance at seminars and lectures on the specific hazards would enable staff to make appropriate recommendations to the governing bodies as they go about the process of approving new developments.	All	Little to no cost	General Fund	Medium	Annual	Annual implementation
MB.2	Adverse Weather, Coastal Erosion/Sea Level Rise, Earthquake, Flood, Landslides, Tsunami, Wildfire	Through newsletters, advertisements, speaking engagements and other public contacts, educate the general public and key stakeholders on the issues, responsibilities, and current efforts and successes in the area of hazard mitigation and disaster preparedness.	All	Little to no cost	General Fund	Medium	Annual	Annual implementation
MB.3	Adverse Weather, Earthquake, Flood, Landslides, Tsunami, Wildfire	Train the police, harbor and fire department supervisors and officers on the activation of the County's early warning system and additional public notification systems to ensure that warning systems function as tools to mitigate potential hazard impacts to citizens.	Fire Dept/ Police Dept / Harbor Dept	Less than \$10,000	General Fund	Medium	Annual	Annual implementation





ID	Hazard(s) Mitigated	Description/Background/Benefits	Lead Agency and Partners	Cost Estimate	Potential Funding	Priority	Timeline	Status/ Implementation Notes
MB.4	Adverse Weather, Coastal Erosion/Sea Level Rise, Earthquake, Flood, Landslides, Tsunami, Wildfire	Survey the applicable department heads as to their perceived hazard mitigation and disaster preparedness needs. Convene a special meeting of the Disaster Council to prioritize these needs and develop funding strategies.	Fire Department	Little to no cost	Staff Time	High	Annual	Annual implementation
MB.5	Biological agents	Participate in the public education process of human and agricultural health related issues as available.	Admin/FD	Little to no cost	Staff Time	Medium	2-3 yrs.	In progress
MB.6	Biological agents	Encourage broad participation in County public and agricultural health associated emergency preparedness exercises	Admin/FD	Little to no cost	Staff Time	Medium	1 yr.	In progress
MB.7	Biological agents	Increase involvement of special needs populations (disabled, elderly) in education, awareness, hazard mitigation and disaster preparedness activities	Admin/FD	Little to no cost	Staff Time	Medium	1 yr.	In progress
MB.8	Earthquake	Perform a seismic safety review of all current City structures, infrastructure and facilities paying close attention to structural and non-structural mitigation of all facilities. Convene the Disaster Council to prioritize the findings of the seismic safety review and research funding strategies.	PS / Fire Department	Less than \$10,000	Staff Time	High	Annual	Annual Implementation
MB.9	Flood	Continue to work cooperatively with the state and federal flood-related agencies	All	Little to no cost	Staff Time	Medium	Annual	Annual Implementation
MB.10	Tsunami	Review the current City Tsunami Plan and update it as necessary to ensure regional consistency with the SLO County Tsunami Plan	Admin / Fire Department	Little to no cost	Staff Time	Medium	Annual	Annual Implementation





ID	Hazard(s) Mitigated	Description/Background/Benefits	Lead Agency and Partners	Cost Estimate	Potential Funding	Priority	Timeline	Status/ Implementation Notes
MB.11	Tsunami	Educate the public about tsunami dangers and appropriate response and mitigation actions	Fire Department	Little to no cost	Staff Time	Medium	Annual	Annual Implementation
MB.12	Tsunami	Evaluate the potential to maximize life safety associated with the use of route signs, tactical staging areas, tsunami safe zones, and traffic control points as outlined in the County Tsunami Plan.	Fire Department / PS	Less than \$10,000	FEMA HMA	High	1-2 years	Deferred. Current City Management is re-evaluating the regional plan to implement
MB.13	Wildfire, Hazardous Trees	Work with the California State Parks and San Luis Obispo County Fire Safe Council to initiate fuel thinning and chipping projects in the Black Mountain area within the City limits.	Fire Department	Less than \$10,000	FEMA HMA	Medium	3-5 yrs.	Annual implementation. State Parks has been a great partner providing great work to improve Black Hill
MB.14	Wildfire	Continue to support the City's weed abatement program to provide additional wildfire mitigation through vegetation management.	Fire Department	7 to 10% of Fire Marshal	PDM Grant/ Staff Time/ Dept. Budget	Medium	Annual	Annual Implementation
MB.15	Flood	Amend the Municipal Code to require flood risk disclosure and active acknowledgment of expanded flood risk in property purchases/turnovers.	Community Development	Unknown	General Fund	Medium	1-2 years	New
MB.16*	Flood	Require new development in the Sea Level Rise Hazard Overlay Zone to evaluate potential impacts to adjacent or nearby properties from all proposed structural flood protection measures to ensure that these measures will not create adverse direct and/or cumulative on-site or off-site impacts.	Community Development	Unknown	Development Fees	Medium	Annual	New





ID	Hazard(s) Mitigated	Description/Background/Benefits	Lead Agency and Partners	Cost Estimate	Potential Funding	Priority	Timeline	Status/ Implementation Notes
MB.17*	Flood	Continue to adopt and enforce the most up-to-date California Building Standards Code and California Fire Code, with appropriate local amendments.	Community Development; Fire	Unknown	General Fund	Medium	Annual	New
MB.18	Flood	Develop timing triggers for actions to address sea level rise impacts for each character area in Morro Bay based on sea level rise adaptation studies, sea level rise modeling, best available science, and the vision for each character area.	Community Development	Unknown	General Fund	Medium	3-5 yrs.	New
MB.19*	Flood	During Development Review, determine if any structures meant for human habitation are to be constructed within the 100-year floodplain or in the Sea Level Rise Hazard Overlay Zone. If necessary, evaluate each structure's safety from flood and sea level rise related hazards, and recommend remedial actions.	Development Standards/ Community Development	Unknown	General Fund, Development Fees	Medium	Annual	New

*mitigates impacts to new development





D.6 Implementation and Maintenance

Moving forward, the City will use the mitigation action table in the previous section to track progress on implementation of each project. As illustrated in the completed actions table (Table D.23), much progress has been made since the plan was originally developed. Implementation of the plan overall is discussed in Section 8 of the Base Plan.

D.6.1 Incorporation into Existing Planning Mechanisms

The information contained within this plan, including results from the Vulnerability Assessment and the Mitigation Strategy, will be used by the City to help inform updates and the development of local plans, programs and policies. The Engineering Division may utilize the hazard information when implementing the City's Community Investment Program and the Planning and Building Divisions may utilize the hazard information when reviewing a site plan or other type of development applications. The City will also incorporate this LHMP into the Safety Element of their General Plan, as recommended by Assembly Bill (AB) 2140.

As noted in Section 8 of the Base Plan, the HMPC representatives from Morro Bay will report on efforts to integrate the hazard mitigation plan into local plans, programs and policies and will report on these efforts at the annual HMPC plan review meeting.

D.6.2 Monitoring, Evaluation and Updating the Plan

The City will follow the procedures to monitor, review, and update this plan in accordance with San Luis Obispo County as outlined in Section 8 of the Base Plan. The City will continue to involve the public in mitigation, as described in subsection 8.3 of the Base Plan. The City of Morro Bay Planning Team will be responsible for representing the City in the County HMPC, and for coordination with City staff and departments during plan updates. The City realizes it is important to review the plan regularly and update it every five years in accordance with the Disaster Mitigation Act Requirements as well as other State of California requirements.





E.1 Community Profile

E.1.1 Mitigation Planning History and 2019 Process

This annex was created during the development of the 2019 San Luis Obispo County Hazard Mitigation Plan update. This Jurisdictional Annex builds upon the previous version of the City of Paso Robles Local Hazard Mitigation Plan completed in February 2016; that previous mitigation plan is referenced several times by the City's General Plan. A review of jurisdictional priorities found no significant changes in priorities since the last update.

The City's Local Planning Team (LPT) held responsibility for implementation and maintenance of the plan. The City Fire Chief is responsible for updating the plan.

Table E.1 Paso Robles Hazard Mitigation Plan Revision Planning Group

Department or Stakeholder	Title
Fire Department	Fire Chief
Finance Department	Senior Accountant
Community Services	Rec. Services Manager
Fire Department	Battalion Chief
Police Department	Commander
Public Works	Water/Street Manager
Community Development	Chief Building Official

More details on the planning process follow and how the jurisdictions, service districts and stakeholders participated, as well as how the public was involved during the 2019 update, can be found in Section 3 of the Base Plan.

E.1.2 Geography and Climate

Paso Robles is located in northern San Luis Obispo County, California, approximately halfway between the cities of Los Angeles and San Francisco. It is 19.4 square miles (12,534.7 acres) and 24 miles inland from the Pacific Ocean. Paso Robles is considered to be in the most northern area of Southern California.

Paso Robles is bordered on the south and west by the rugged mountainous ridges of the Santa Lucia Coastal Range, to the east by the low hills of the La Panza and Temblor Ranges, and to the north by the low hills and flat-topped mesas of the Diablo Range. The highest elevations in the vicinity are located in the Santa Lucia Coastal Range where many peaks are 2,000 to 3,400 feet above mean sea level. Substantial ridgelines are distributed throughout the western, southern, and eastern portions of the City. The Mediterranean climate of the region and coastal influence produce moderate temperatures year round, with rainfall concentrated in the winter months.

Within the City limits, the Salinas River, U.S. Highway 101 and the Union Pacific Railroad divides the City east to west at the center of the City. The City is bounded by steep hills and canyons on the west, and open rolling hills to the east. Suburban residential development frames the City on the southern and eastern edges, with lower density residential development to the north and west of the City. Agricultural uses both north and south of the



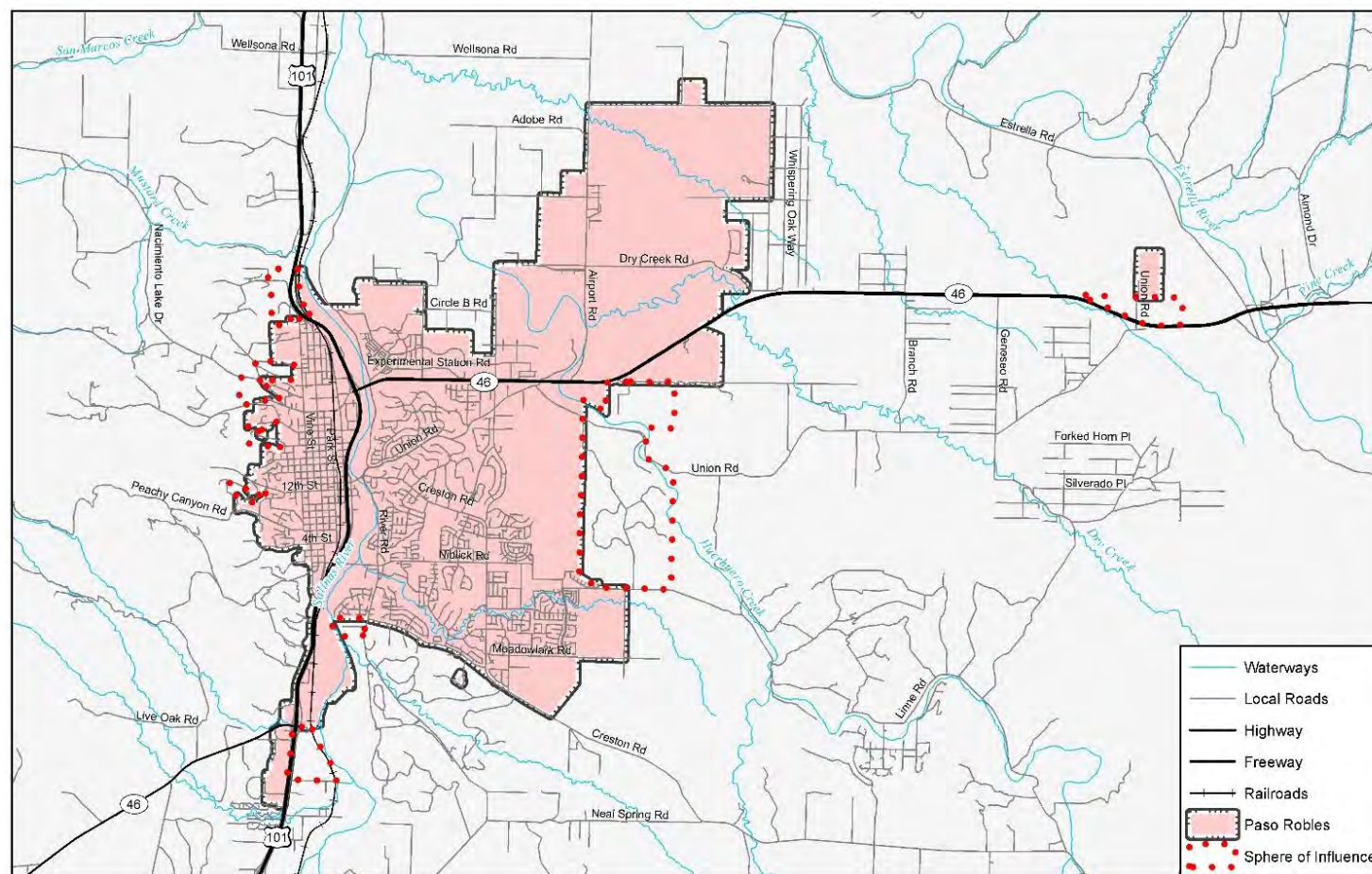
City eventually give way to the unincorporated communities of Templeton and San Miguel, approximately 5 miles south and 9 miles north, respectively.

Figure E.1 displays a map of the City of Paso Robles planning area.





Figure E.1 The City of Paso Robles



Map compiled 5/2019;
intended for planning purposes only.
Data Source: San Luis Obispo County,
US Census TIGER Database, CA Open
Data Portal, BLM/California State Office, LAFCO



E.1.3 History

The Paso Robles area was home to several Native American tribes for thousands of years before the mission era.

In 1857, James and Daniel Blackburn purchased the Rancho Paso de Robles Mexican land grant. The land was a rest-stop for travelers of the Camino Real trail, and was known for its mineral hot springs. In 1864, the first El Paso de Robles Hotel was constructed and featured a hot mineral springs bath house. In 1886, after the coming of the Southern Pacific Railroad, work began on laying out a town site, with the resort as the nucleus.

Paso Robles incorporated as a City in 1889. That same year, construction began on the current El Paso de Robles Hotel, which opened for business in 1891.

For a time, Paso Robles was known as the "Almond City" because the local almond growers created the largest concentration of almond orchards in the world. The ranchers in the outlying areas were very important to the Paso Robles area. On these ranches were cattle and horses, grain crops (primarily wheat and barley), garden produce and fruit and nut orchards. Many of these ranch lands and orchards have become vineyards for the many wineries which currently draw tourists to the area.

Wine grapes were introduced to the Paso Robles soil in 1797 by the Spanish conquistadors and Franciscan missionaries. The first vineyardists in the area were the Padres of the Mission San Miguel, and their old fermentation vats and grapevine artwork can still be seen at the Mission, north of the City of Paso Robles. Commercial winemaking in the Paso Robles region dates back to 1882 when Andrew York, a settler from Indiana, established the Ascension Winery at what is now York Mountain Winery. Paso Robles' reputation as a premier wine region became established in the 1920s and 30s, and continues to this day.

Paso Robles has a "Council-Manager" general law form of government where the City Manager is appointed by the City Council and is the Chief Executive Officer of the Municipal Corporation. The City Council acts as the board of directors of the municipal corporation and meets in a public forum where citizens may participate in the governmental process.

The City Council consists of five members elected at-large, on a non-partisan basis. Residents elect the Mayor and four Council members, making each accountable to the entire citizenry. Council members serve four-year overlapping terms. The mayor is directly elected and serves a two-year term. The City Council establishes City policies, approves ordinances and resolutions, makes land use decisions, approves agreements and contracts, hears appeals on decisions made by City staff or advisory committees, and sets utility rates. The Mayor and City Council members receive a monthly stipend set by resolution.

The City Manager is the Chief Executive Officer of the City. The City Manager is appointed by the City Council to enforce city laws, to direct the operations of city government, to prepare and manage the municipal budget, and to implement the policies and programs initiated by the City Council. The City Manager is responsible to the City Council, and directs departments and operations.

The City Attorney is appointed by the City Council and works under contract to the City. The City Attorney is the legal advisor for the council. He or she provides general legal advice on all aspects of city business and represents the City in legal actions.

The City Clerk is an elected official. The City Clerk is charged with responsibility of maintaining records of council actions, permanent records of all city transactions and documents, and coordinating the city's elections. The Deputy City Clerk is an appointed staff position that assists the City Clerk in carrying out all duties.





The City Treasurer is an elected position responsible for the custody and investment of all city funds. The City Treasurer is also responsible for administering the City budget.

Boards, commissions and special committees composed of local citizens are frequently appointed by the City Council to advise the City Council in one or more aspects of city government. Typical advisory committees include Parks & Recreation, Streets and Utilities, Airport, and Youth and Senior Citizens. The Planning Commission implements Council development and land use policy, and makes recommendations for policy revisions.

One of the major investments the City makes is the City's work force. City employees perform the day-to-day functions necessary to provide services to the community. Department heads administer specific functions of city government and are responsible to the City Manager. Such positions are Public Works Director, Community Development Director, Library and Recreation Services Director, Administrative Services Director, and Police and Fire Chiefs.

E.1.4 Economy

Based on the 2017 American Community Survey (ACS) Paso Robles' labor force is estimated to be 16,782 persons. The City has a relatively diverse economic, with no single sector or industry making up more than 20% of all jobs. The educational services, health care and social services accounts for 17.8% of jobs, followed by retail trades (12.5%); manufacturing (12.0%); and arts, entertainment and recreation, accommodation, & food services (11.7%). While the City's manufacturing sector has declined some – as recently as 2001 it represented 23.2% of the local economy – Paso Robles is one of the few areas in the region where manufacturing still accounts for a sizable fraction of employment. By comparison, manufacturing in San Luis Obispo County as a whole is approximately 6.0%.

The City's largest employers include Paso Robles School District, Firestone Walker, Walmart, Applied Tech., City of Paso Robles, IQMS, Joslyn-Sunbank, Zurn, Target, Lowes, and Cuesta College. At 4.5%, the City's unemployment rate is half what it was in 2012 in the aftermath of the economic recession. This has been accompanied by a nearly 12% increase in per capita income, from \$27,199 in 2012 to \$30,446 in 2017.

Table E.2 shows how Paso Robles' labor force breaks down by occupation and industry based on estimates from the U.S. Census Bureau's 2017 American Community Survey.

As the leading agricultural business in the county, the area's wine industry attracts more than half a million visitors to San Luis Obispo County annually. A 2007 study of the Paso Robles and Greater San Luis Obispo County Wine and Wine Grape industries have an annual impact of \$1.8 billion on the state and local economy. This has helped the economy enjoy approximately \$113 million annually in tourism expenditures.

Table E.2 City of Paso Robles Employment by Industry (2017)

Industry	# Employed
Population (2017)	31,409
In Labor Force	16,782
Agriculture, forestry, fishing and hunting, and mining	834
Armed Forces	70
Construction	1,154
Manufacturing	2,008
Wholesale trade	339



Industry	# Employed
Retail trade	2,091
Transportation and warehousing, and utilities	694
Information	234
Finance and insurance, and real estate and rental and leasing	479
Professional, scientific, and management, and administrative and waste management services	1,070
Educational services, and health care and social assistance	2,980
Arts, entertainment, and recreation, and accommodation and food services	1,969
Other services, except public administration	900
Public administration	1,215
Unemployed	745

Source: U.S. Census Bureau American Community Survey 2012-2017 5-Year Estimates, www.census.gov/

E.1.5 Population

The U.S. Census Bureau estimated the City's 2017 population as 31,409, up from 29,793 at the 2010 census. Table E.3 shows an overview of key social and demographic characteristics of the City taken from the U.S. Census Bureau's American Community Survey.

Table E.3 City of Paso Robles Demographic and Social Characteristics, 2012-2017

City of Paso Robles	2012	2017	% Change
Population	29,770	31,409	+5.5%
Median Age	35.1	36.8	+4.8%
Total Housing Units	11,686	12,391	+6.0%
Housing Occupancy Rate	93.9%	95.2%	+1.3%
% of Housing Units with no Vehicles Available	5.1%	4.2%	-0.9%
Median Home Value	\$369,800	\$404,700	+9.4%
Unemployment	9.0%	4.5%	-4.5%
Mean Travel Time to Work (minutes)	22.8	23.2	+1.8%
Median Household Income	\$57,977	\$61,053	+5.3%
Per Capita Income	\$27,199	\$30,446	+11.9%
% of Individuals Below Poverty Level	12.2%	12.1%	-0.1%
# of Households	10,969	11,802	+7.6%
Average Household Size	2.67	2.65	-0.7%
% of Population Over 25 with High School Diploma	85.0%	84.2%	-0.8%
% of Population Over 25 with Bachelor's Degree or Higher	20.9%	23.8%	+2.9%
% with Disability	11.2%	9.3%	-1.9%
% Speak English less than "Very Well"	12.0%	13.6%	+1.6%

Source: U.S. Census Bureau American Community Survey 2012-2017 5-Year Estimates, www.census.gov/

Despite the economic gains discussed in the previous section, the number of individuals living below the poverty level has stayed relatively constant, although it is still below average for the County (13.8%) and for California as





(15.1%). The percentage of high school graduates and college graduates are below average for the County, State, and Nation as a whole. The number of individuals who speak English less than very well is also significantly above the County averages (6.8%), though still below the State average (18.4%).

E.1.6 Development Trends

According to the 2003 General Plan Land Use Element (revised in April 2014) approximately 78.1 percent (8,639 acres) of the City's total land area is developed as residential, commercial, mixed use and industrial land, and public facilities uses. The remaining land is made up of 2,448 acres of agriculture (7.3 percent) and parks and open space (14.5 percent).

Table E.4 shows the potential land use categories for the 2025 build-out population of 44,000 persons as identified in the City's General Plan. However, as noted in the revised Land Use Element, it is expected that an additional 20 years (2045) or longer will be needed to reach the 44,000 persons build-out population.

Table E.4 General Plan Development Potential (2014 Update)

Land Use Category	Acreage	Percent
Commercial	1,271	10.0%
Business Park/Industrial	1,721	13.5%
Other/Public Facilities	1,947	15.3%
Agriculture & Open Space	2,572	20.0%
Residential	5,228	41.2%
Total	12,739	100%

Source: City of El Paso de Robles General Plan 2003 Land Use Element, as amended April 1, 2014

When the General Plan Update was adopted in 2003, based on the pace of development activity at that time, it was anticipated that residential build-out of the City, resulting in a population of 44,000, would occur by 2025. However, the national economic slowdown that began in 2007, coupled with the history of periodic slowdowns over prior decades, has caused the City to consider that build-out and an attendant population of 44,000 may take more than 20 additional years: to 2045 or longer, to attain.

Updated zoning and land use maps can be found on the City's website.

E.2 Hazard Identification and Summary

The Paso Robles planning team identified the hazards that affect the City and summarized their frequency of occurrence, spatial extent, potential magnitude, and significance specific to their community (see Table E.5). There are no hazards that are unique to Paso Robles. The overall hazard significance takes into account the geographic area, probability and magnitude as a way to identify priority hazards for mitigation purposes. 'NI' in the table means not identified. This is discussed further in the Vulnerability section.

Table E.5 City of Paso Robles – Hazard Summaries

Hazard	Geographic Area	Probability of Future Occurrence	Magnitude/Severity (Extent)	Overall Significance
Adverse Weather: Thunderstorm/ Heavy Rain/Hail/Lighting/Dense Fog/Freeze	Significant	Highly Likely	Limited	High
Adverse Weather: High Wind	Significant	Highly Likely	Limited	High



Adverse Weather: Extreme Heat	Extensive	Highly Likely	Limited	High
Agricultural Pest Infestation and Disease	Limited	Limited	Unlikely	Low
Biological Agents (naturally occurring)	Limited	Limited	Unlikely	Low
Dam Incidents	Significant	Occasional	Limited	Low
Drought and Water Shortage	Extensive	Likely	Limited	High
Earthquake	Significant	Likely	Critical	High
Flood	Significant	Likely	Limited	High
Landslides and Debris Flow	Limited	Likely	Limited	High
Subsidence	Likely	Limited	Negligible	High
Wildfire	Extensive	Highly Likely	Critical	High
Human Caused: Hazardous Materials	Extensive	Highly Likely	Negligible	Low
Geographic Area Limited: Less than 10% of planning area Significant: 10-50% of planning area Extensive: 50-100% of planning area Probability of Future Occurrences Highly Likely: Near 100% chance of occurrence in next year or happens every year. Likely: Between 10 and 100% chance of occurrence in next year or has a recurrence interval of 10 years or less. Occasional: Between 1 and 10% chance of occurrence in the next year or has a recurrence interval of 11 to 100 years. Unlikely: Less than 1% chance of occurrence in next 100 years or has a recurrence interval of greater than every 100 years.		Magnitude/Severity (Extent) Catastrophic—More than 50 percent of property severely damaged; shutdown of facilities for more than 30 days; and/or multiple deaths Critical—25-50 percent of property severely damaged; shutdown of facilities for at least two weeks; and/or injuries and/or illnesses result in permanent disability Limited—10-25 percent of property severely damaged; shutdown of facilities for more than a week; and/or injuries/illnesses treatable do not result in permanent disability Negligible—Less than 10 percent of property severely damaged, shutdown of facilities and services for less than 24 hours; and/or injuries/illnesses treatable with first aid Significance Low: minimal potential impact Medium: moderate potential impact High: widespread potential impact		

E.3 Vulnerability Assessment

The intent of this section is to assess Paso Robles's vulnerability separate from that of the planning area as a whole, which has already been assessed in subsection 5.3 Risk Assessment in the main plan. This vulnerability assessment analyzes the population, property, and other assets at risk to hazards ranked of medium or high significance that may vary from other parts of the planning area.

The information to support the hazard identification and risk assessment was based on the City's previous LHMP. A Local Hazard Mitigation Plan Update Guide and associated worksheets was distributed to each participating municipality or special district to complete during update process in 2019. Information collected





was analyzed and summarized in order to identify and rank all the hazards that could impact anywhere within the County, as well as to rank the hazards and identify the related vulnerabilities unique to each jurisdiction.

Each participating jurisdiction was in support of the main hazard summary identified in the Base Plan (See Table 5-2). However, the hazard summary rankings for each jurisdictional annex may vary slightly due to specific hazard risk and vulnerabilities unique to that jurisdiction. Identifying these differences helps the reader to differentiate the jurisdiction's risk and vulnerabilities from that of the overall County.

Note: The hazard "Significance" reflects overall ranking for each hazard, and is based on the City of Paso Robles's HMPC member input from the Data Collection Guide and the risk assessment developed during the planning process (see subsection 5.1 of the Base Plan), which included a more detailed qualitative analysis with best available data.

The hazard summaries in Table E.5 above reflect the hazards that could potentially affect the City. The discussion of vulnerability for each of the following hazards is located in subsection E.3.2 Estimating Potential Losses. Based on this analysis, the priority hazards (High Significance) for mitigation are:

- Adverse Weather: Thunderstorm/Heavy Rain/Hail/Lighting/Dense Fog/Freeze
- Adverse Weather: High Wind
- Adverse Weather: Extreme Heat
- Drought and Water Shortage
- Earthquake
- Flood
- Landslides and Debris Flow
- Subsidence
- Wildfire

Other Hazards

Hazards assigned a significance rating of Low and which do not differ significantly from the County ranking (e.g., Low vs. High) are not addressed further in this plan, and are not assessed individually for specific vulnerabilities in this section. In the City of Paso Robles, those hazards include dam incidents and hazardous materials incidents.

Coastal hazards (coastal storm/coastal erosion/sea level rise and tsunami) are Not Applicable (N/A) to the City of Paso Robles.

E.3.1 Assets at Risk

This section considers Paso Robles's assets at risk, including values at risk, critical facilities and infrastructure, historic assets, economic assets and growth and development trends.

Values at Risk

The following data on property exposure is derived from the San Luis Obispo County 2019 Parcel and Assessor data. This data should only be used as a guideline to overall values in the City as the information has some limitations. The most significant limitation is created by Proposition 13. Instead of adjusting property values annually, the values are not adjusted or assessed at fair market value until a property transfer occurs. As a result, overall value information is likely low and does not reflect current market value of properties. It is also important





to note that in the event of a disaster, it is generally the value of the infrastructure or improvements to the land that is of concern or at risk. Generally, the land itself is not a loss. Table E.6 shows the exposure of properties (e.g., the values at risk) broken down by property type for the City of Paso Robles.

Table E.6 2019 Property Exposure for the City of Paso Robles by Property Types

Property Type	Parcel Count	Improved Value	Content Value	Total Value
Agricultural	25	\$47,041,880	\$47,041,880	\$94,083,760
Commercial	552	\$347,729,528	\$347,729,528	\$695,459,056
Government/Utilities	175	\$1,520,500	--	\$1,520,500
Other/Exempt/Misc.	313	\$99,728,929	--	\$99,728,929
Residential	8,281	\$1,768,587,601	\$884,293,801	\$2,652,881,402
Multi-Family Residential	728	\$223,890,340	\$111,945,170	\$335,835,510
Mobile/Manufactured Homes	326	\$42,447,085	\$21,223,543	\$63,670,628
Residential: Other	138	\$136,086,048	\$68,043,024	\$204,129,072
Industrial	71	\$101,658,828	\$152,488,242	\$254,147,070
Vacant	105	\$53,222,625	--	\$53,222,625
TOTAL	10,714	\$2,821,913,364	\$1,632,765,187	\$4,454,678,551

Source: Wood Plc analysis based on ParcelQuest and San Luis Obispo County Assessor's Office data 2019

Critical Facilities and Infrastructure

A critical facility may be defined as one that is essential in providing utility or direction either during the response to an emergency or during the recovery operation. See Section 5 of the Base Plan for more details on the definitions and categories of critical facilities.

An inventory of critical facilities in the City of Paso Robles from San Luis Obispo County GIS is provided in Table E.7 and illustrated in Figure E.3. Table E.8 lists additional critical assets identified by the planning team.

Table E.7 City of Paso Robles's Critical Facilities

Facility Type	Counts
Colleges / Universities	1
Day Care Facilities	14
Emergency Medical Service Stations	1
Fire Stations	3
Local Law Enforcement	1
Nursing Homes	2
Private Schools	3
Public Schools	12
Supplemental Colleges	1
Urgent Care	2
Power Plants	1





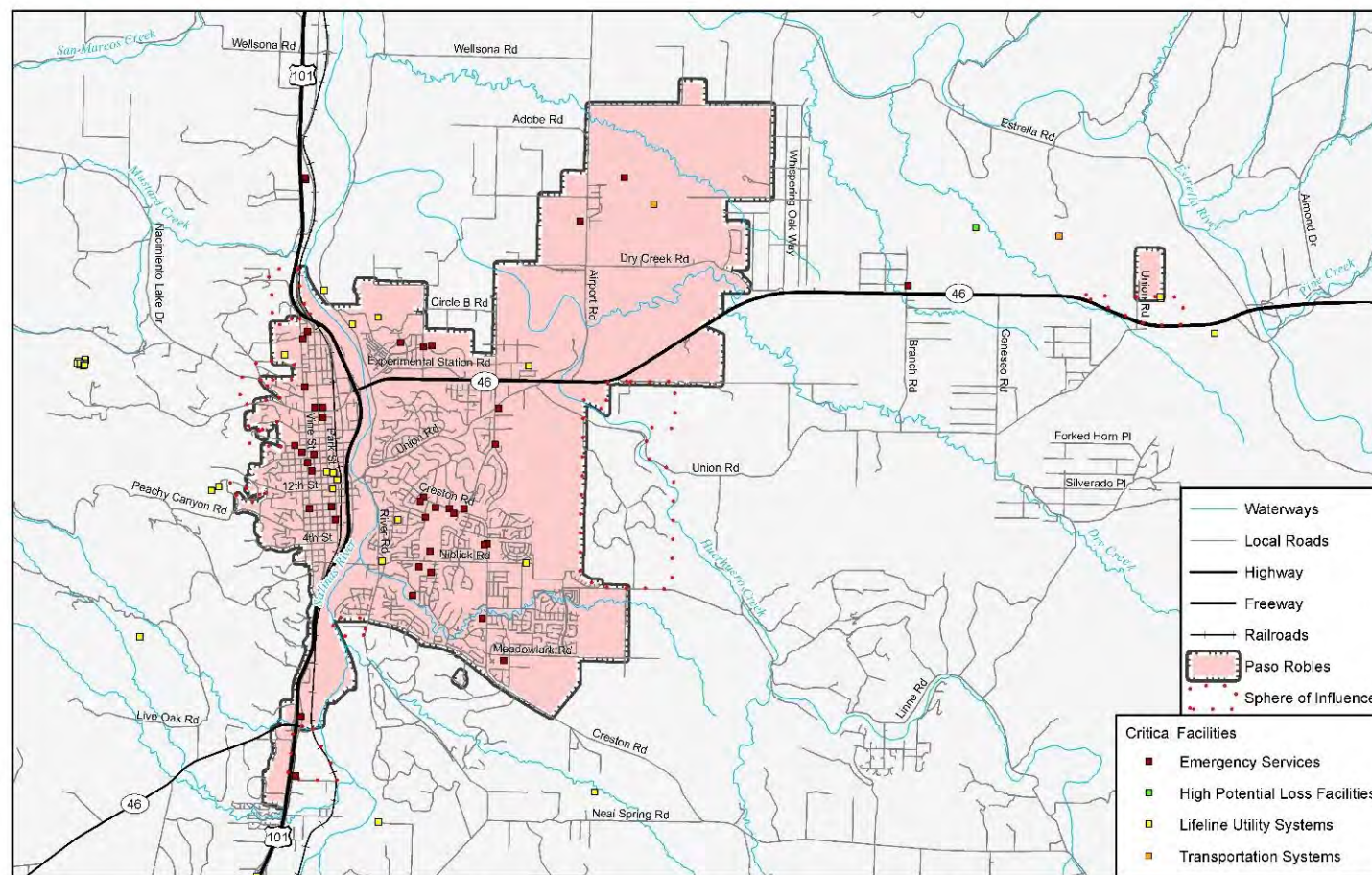
Facility Type	Counts
AM Transmission Towers	1
FM Transmission Towers	1
Microwave Service Towers	12
Water Treatment Facilities	1
Energy Commission Facilities	2
City Hall	1
Centennial Park	1
Solar Facility	1
Wastewater Treatment Facility	1
Reclaimed Water Facility	1
Senior Center	1
Airports	1
Total	64

Source: San Luis Obispo County Planning & Building, HIFLD 2017





Figure E.2 Critical Facilities in Paso Robles



**Table E.8 Critical Assets Identified by Paso Robles Planning Team**

Name of Asset	Type	Replacement Value
Public Safety Center	EI	\$26,617,412
Fire Station 2	EI	\$2,564,063
Fire Station 3	EI	\$569,290
City Hall / Library	EI	\$34,939,638
Water Maintenance Yard	EI	\$1,162,597
Water yard	EI	\$1,260,592
21st Reservoir	EI	\$8,135,298
Golden Hill Reservoir	EI	\$4,929,794
Merry Hill Reservoir	EI	\$849,806
Airport Complex	EI	\$9,545,306
Bus / Train Station	EI	\$2,953,766
Senior Center	EI	\$4,602,493
Veterans Bldg.	EI	\$3,234,992
Barney Schwartz Park	VF	\$14,041,296
City Park	VF	\$5,402,108
Lawrence Moore Park	VF	\$379,124
Paso Robles Municipal Pool	VF	\$3,708,901
Sherwood Forest	VF	\$1,690,419

Source: Paso Robles Planning Team.

EI: Essential Infrastructure. VF: Vulnerable Facility

Transportation and Lifeline Facilities

Major transportation and lifeline facilities are located adjacent to US Highway 101 and the Union Pacific Railroad line that traverse through the City. Damages to these transportation corridors would impact not only Paso Robles but the entire region.

Other lifelines include Niblcik Bridge, 13th Street Bridge, Highway 46E Bridge, Highway 46W and G14.

Historic and Cultural Resources

The National Register of Historic Places contains five sites in the City of Paso Robles:

- Bank of Italy (aka Old Bank of America), 1245 Park St.
- Brewster-Dutra House (aka Moye House), 1803 Vine St.
- Carnegie Library, City Park, 800 12th St.
- Lincoln School (aka Adelaida School), 9000 Chimney Rock Rd. (outside City limits)
- Paso Robles Almond Growers Association Warehouse (aka Farmers' Alliance Building), 525 Riverside Ave.

There is also one California State Historical Landmark located in Paso Robles: the Estrella Adobe Church.

Natural Resources

Natural resources are important to include in benefit-cost analyses for future projects and may be used to leverage additional funding for projects that also contribute to community goals for protecting sensitive natural





resources. Awareness of natural assets can lead to opportunities for meeting multiple objectives. For instance, protecting wetlands areas protects sensitive habitat as well as attenuates and stores floodwaters.

Key natural assets include the riverbed with riverwalk and open space areas throughout the City.

Economic Assets

Key economic assets include: the downtown corridor, car dealerships, Lowe's Plaza, Woodland Plaza, Target Center, Airport commercial businesses, and Commerce Road businesses.

E.3.2 Estimating Potential Losses

Note: This section details vulnerability to specific hazards of high or medium significance, where quantifiable, and/or where (according to HMPC member input) it differs from that of the overall County.

Table E.6 above shows Paso Robles's exposure to hazards in terms of number and value of structures. San Luis Obispo County's parcel and assessor data was used to calculate the improved value of parcels. The most vulnerable structures are those in the floodplain (especially those that have been flooded in the past), unreinforced masonry buildings, and buildings built prior to the introduction of modern-day building codes. Impacts of past events and vulnerability to specific hazards are further discussed below (see subsection 5.1 Hazard Identification for more detailed information about these hazards and their impacts on San Luis Obispo County as a whole).

Adverse Weather: Thunderstorm/Heavy Rain/Hail/Lighting/Dense Fog/Freeze

Paso Robles's risk and vulnerability to this hazard does not differ substantially from that of the County overall. Weather data for the North County Inland Area, Paso Robles Weather Station, can be found in subsection 5.3.1 of the Base Plan.

Adverse Weather: High Wind/Tornado

Paso Robles's risk and vulnerability to this hazard does not differ substantially from that of the County overall.

Adverse Weather: Extreme Heat

Paso Robles's risk and vulnerability to this hazard does not differ substantially from that of the County overall. Weather data for the North County Inland Area, Paso Robles Weather Station, can be found in subsection 5.3.1 of the Base Plan.

Drought and Water Shortage

The City of Paso Robles gets the majority of its water from the Paso Robles groundwater basin. The Paso Robles basin underlies approximately 640 square miles in northeastern San Luis Obispo County, and is estimated to have over 26 million acre-feet of water in storage. The basin has experienced serious declines over the years due to groundwater pumping, with the largest water use sector being agricultural uses. As a result, the State has identified the Paso Robles basin as the highest priority groundwater basin within San Luis Obispo County. The large volume of the basin means it can continue to supply water through multiple drought years, even though the increased pumping will put additional strain upon the stored groundwater resource. The perennial yield of the Paso Robles Groundwater Basin is estimated to be 89,700 acre-feet per year (AFY). Annual average change in groundwater storage for the period 1981-2011 is estimated at -2,400 AFY.





Until 2015, all water demands in the City were met with groundwater. The City of Paso Robles began using Nacimiento Project Water in 2015. The City holds a right to 6,488 AFY.

Historically, recycled water has not been used as a source of water in Paso Robles. The City is currently upgrading its water treatment system and plans to use its treated wastewater for irrigation and other non-potable uses.

Earthquake

Historically, most of the earthquakes that have occurred near Paso Robles have originated from movement along the San Andreas Fault, which is located approximately 38 miles northeast of the City limits. While no large earthquakes greater than Mw 5.0 have occurred recently within the City limits, a number of relatively large earthquakes outside Paso Robles have caused damage within the County of San Luis Obispo and neighboring counties.

The only known mapped fault within the City of Paso Robles is the Rinconada fault. The potentially active Rinconada fault is mapped through southwestern Paso Robles and crosses Highway 101 just south of Spring Street. A trace of the fault is also identified as running up Spring Street, which corresponds to a line of hot springs that once existed in this area but have since been capped and buried. As a potentially active fault, the Rinconada presents a moderate fault rupture hazard to the City. Further studies to evaluate the activity of the faults are warranted, prior to placing structures near the mapped fault traces.

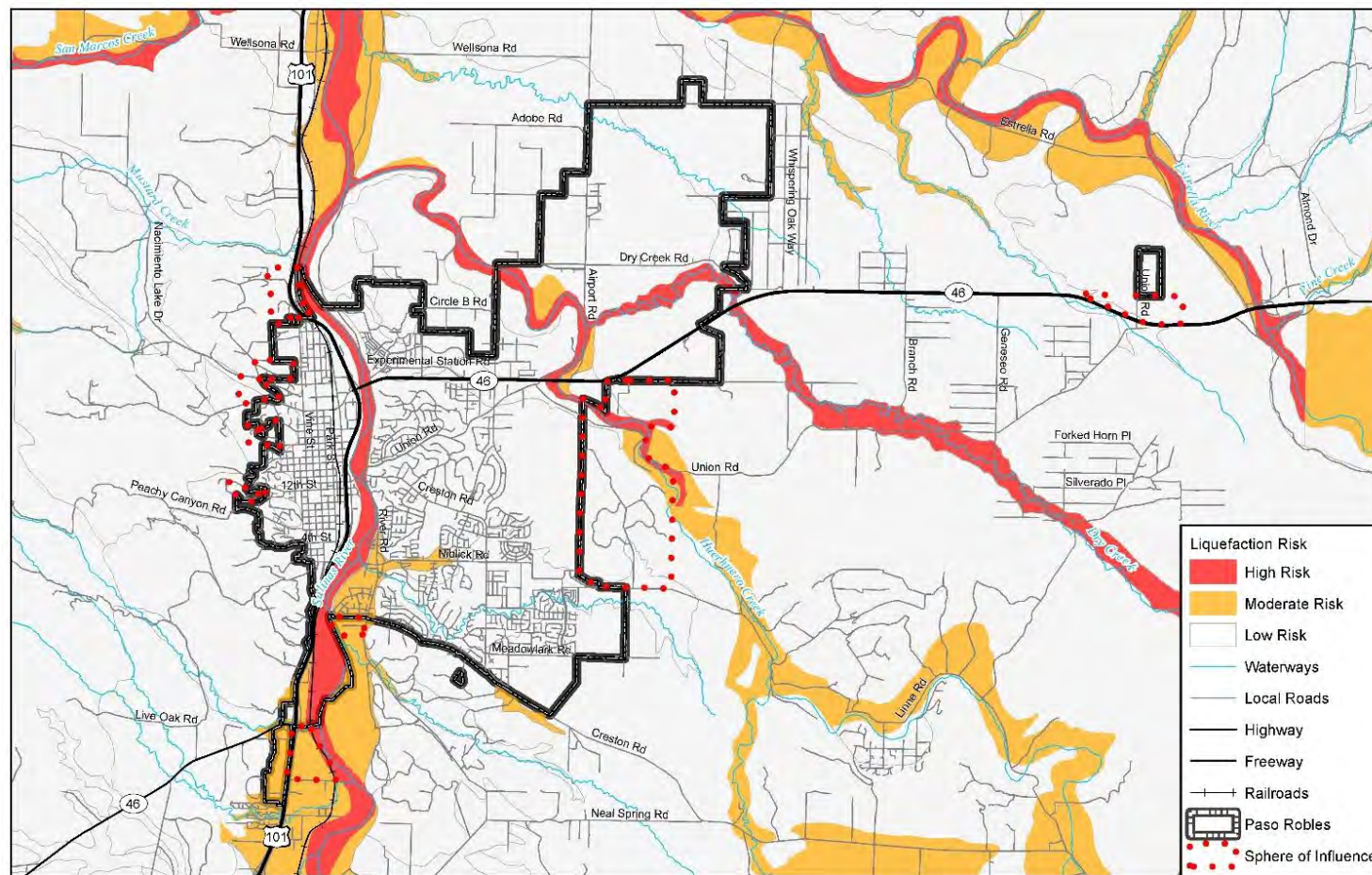
The northern end of the potentially active La Panza fault is located about 20 kilometers (12.43 miles) southeast of Paso Robles, near the town of Creston. The northwest striking La Panza fault is about 75 kilometers (46.6 miles) long. The Huerhuero fault is a possible extension of the La Panza and is mapped trending northwest along Huerhuero Creek south of Highway 46 but is not within the current City limits.

In addition to being at risk of groundshaking as a result of a fault rupture, the City is also susceptible to the effects of liquefaction. The areas of Paso Robles that have a high potential to be underlain by potentially liquefiable sediments are those areas underlain by younger alluvium. Portions of the City that are located on recent alluvium in the low-lying areas adjacent to the Salinas River (or its tributaries) appear to have the highest potential for liquefaction. Site specific studies are needed to evaluate if a geologic unit actually contains potentially liquefiable materials, and if they require mitigation for development. Refer to Section 5 of the Base Plan for additional details on the City's risk to liquefaction.





Figure E.3 City of Paso Robles Liquefaction Risk



Map compiled 6/2019;
intended for planning purposes only.
Data Source: San Luis Obispo County,
US Census TIGER Database, CA Open
Data Portal, BLM/California State Office, LAFCO

0 2.5 5 Miles



**Table E.9 City of Paso Robles High Liquefaction Risk by Property Type**

Property Type	Parcel Count	Improved Value
Commercial	7	\$16,318,866
Government/Utilities	14	--
Other/Exempt/Misc.	18	\$7,183,009
Residential	12	\$4,120,150
Multi-Family Residential	2	\$10,941,483
Mobile/Manufactured Homes	1	\$8,229
Industrial	3	\$5,203,845
Vacant	3	\$1,262,852
TOTAL	60	\$45,038,434

Source: San Luis Obispo County Planning and Building Dept., Assessor's Office, ParcelQuest, Wood Plc Parcel Analysis

Table E.10 City of Paso Robles Moderate Liquefaction Risk by Property Type

Property Type	Parcel Count	Improved Value
Commercial	47	\$79,980,028
Government/Utilities	7	--
Other/Exempt/Misc.	8	\$14,634,770
Residential	375	\$75,137,054
Mobile/Manufactured Homes	1	\$619,485
Residential: Other	2	\$12,124,284
Industrial	5	\$16,516,884
Vacant	12	\$11,398,932
TOTAL	457	\$210,411,437

Source: San Luis Obispo County Planning and Building Dept., Assessor's Office, ParcelQuest, Wood Plc Parcel Analysis

Table E.11 City of Paso Robles Critical Facilities at Risk from Liquefaction

Critical Facility Type	Count	Risk
Public Schools	1	Moderate
Urgent Care	1	Moderate
TOTAL	2	

Source: San Luis Obispo County Planning & Building, HIFLD 2017

Flood and Levee Failure

In Paso Robles, the two most common types of flooding are riverine flooding, and localized flooding. The most serious flood events on record for Paso Robles occurred during storms in the early months of 1969, 1973, 1978, 1995, 2001, 2004-2005, 2005-2006, and 2010-2011.

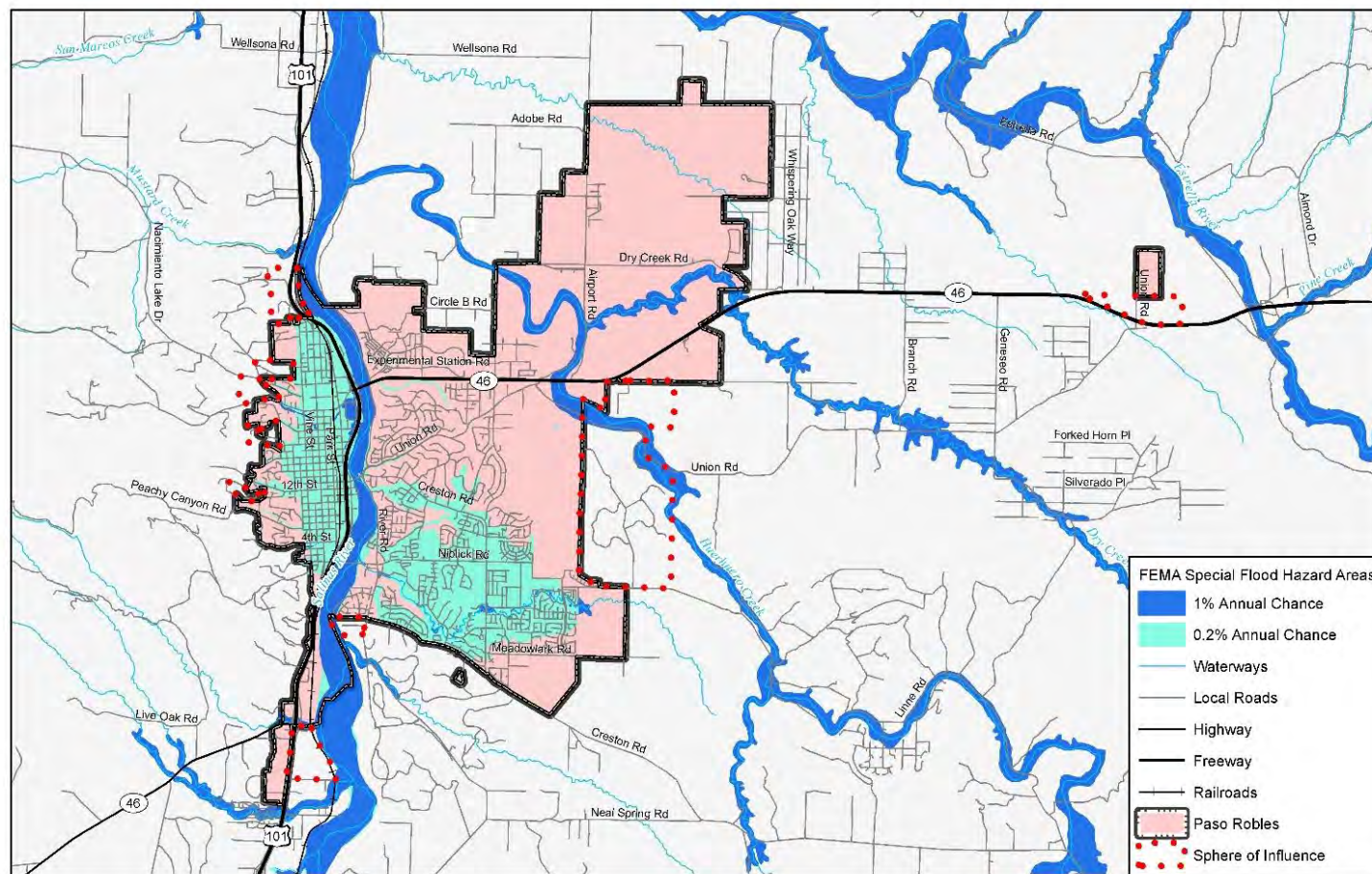
Values at Risk

Following the methodology described in subsection 5.3.11, a flood map for the City of Paso Robles was created (see Figures E.4 and E.5). Tables E.11 and E.12 summarize the values at risk in the City's 100-year and 500-year floodplain, respectively. These tables also detail loss estimates for each flood. Note that the potential loss increases significantly with the 500-year or 0.2% annual chance flood.





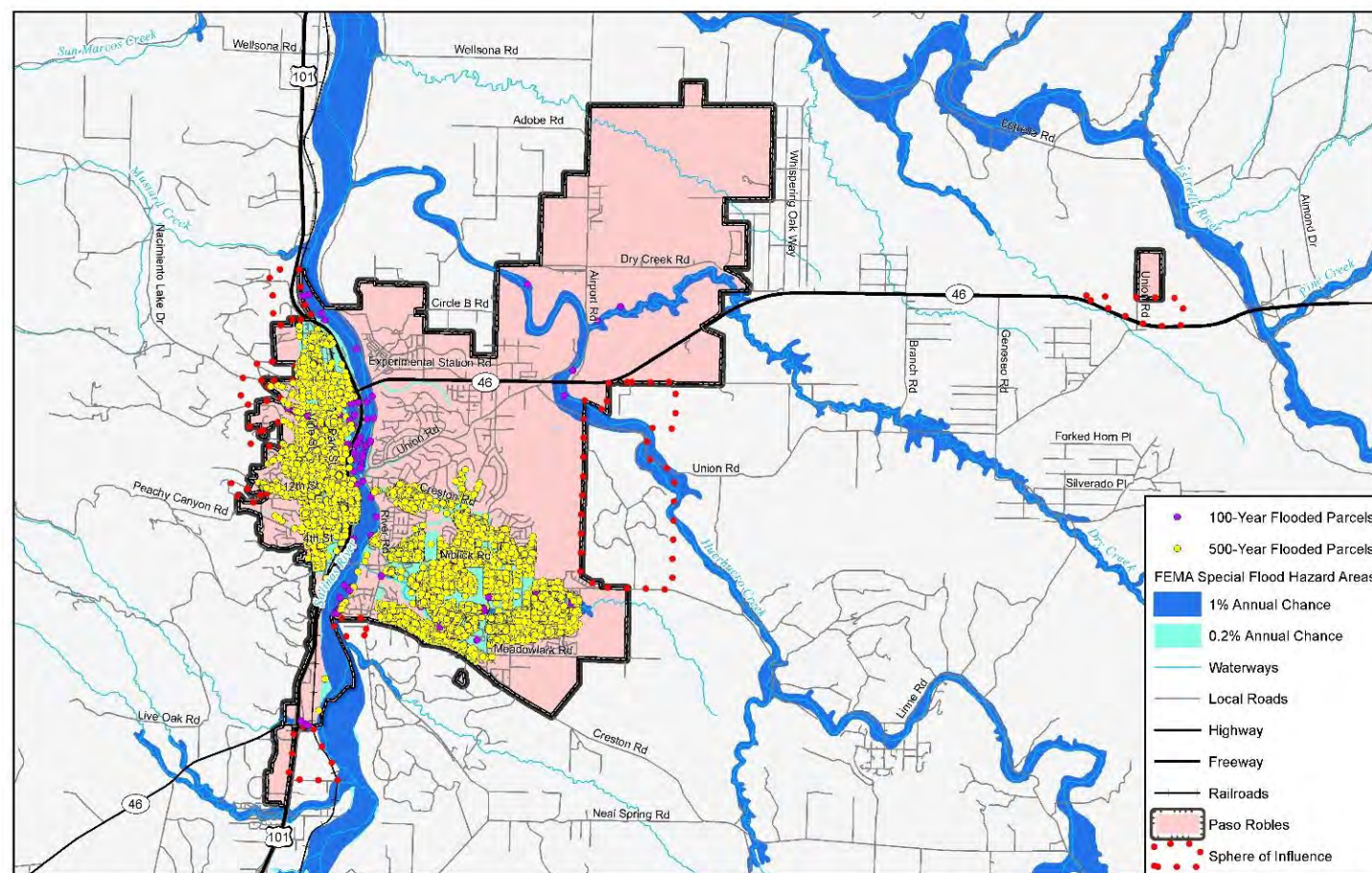
Figure E.4 City of Paso Robles' 100- and 500-Year Floodplains



Map compiled 5/2019;
intended for planning purposes only.
Data Source: San Luis Obispo County,
US Census TIGER Database, CA Open
Data Portal, BLM/California State Office,
LAFCO, FEMA NFHL



Figure E.5 City of Paso Robles' Parcels at Risk of Flooding



Map compiled 5/2019;
intended for planning purposes only.
Data Source: San Luis Obispo County,
US Census TIGER Database, CA Open
Data Portal, BLM/California State Office,
LAFCO, FEMA NFHL, ParcelQuest



Population at Risk

Table E.12 City of Paso Robles 1% (100 year) Floodplain Risk

Property Type	Parcel Count	Improved Value	Content Value	Total Value	Loss Estimate	Population
Commercial	7	\$6,685,871	\$6,685,871	\$13,371,742	\$3,342,936	--
Government/Utilities	27	--	--	\$0	\$0	--
Other/Exempt/Misc.	25	\$7,438,009	--	\$7,438,009	\$1,859,502	--
Residential	31	\$6,036,122	\$3,018,061	\$9,054,183	\$2,263,546	78
Multi-Family Residential	31	\$25,115,004	\$12,557,502	\$37,672,506	\$9,418,127	78
Mobile/Manufactured Homes	1	\$440,283	\$220,142	\$660,425	\$165,106	3
Industrial	1	\$139,934	\$209,901	\$349,835	\$87,459	--
Vacant	3	\$43,711	--	\$43,711	\$10,928	--
TOTAL	126	\$45,898,934	\$22,691,477	\$68,590,411	\$17,147,603	158

Source: San Luis Obispo County Planning and Building Dept., Assessor's Office, ParcelQuest, Wood Plc Parcel Analysis

Table E.13 City of Paso Robles 0.2% (500 year) Floodplain Risk

Property Type	Parcel Count	Improved Value	Content Value	Total Value	Loss Estimate	Population
Agricultural	1	\$4,994,987	\$4,994,987	\$9,989,974	\$2,497,494	--
Commercial	413	\$188,376,646	\$188,376,646	\$376,753,292	\$94,188,323	--
Government/Utilities	95	\$1,500,073	--	\$1,500,073	\$375,018	--
Other/Exempt/Misc.	160	\$42,498,954	--	\$42,498,954	\$10,624,739	--
Residential	4,049	\$679,611,889	\$339,805,945	\$1,019,417,834	\$254,854,458	10,163
Multi-Family Residential	603	\$172,240,571	\$86,120,286	\$258,360,857	\$64,590,214	1,514
Mobile/Manufactured Homes	264	\$29,355,209	\$14,677,605	\$44,032,814	\$11,008,203	663
Residential: Other	113	\$71,386,480	\$35,693,240	\$107,079,720	\$26,769,930	284
Industrial	43	\$46,126,123	\$69,189,185	\$115,315,308	\$28,828,827	--
Vacant	34	\$7,909,348	--	\$7,909,348	\$1,977,337	--
TOTAL	5,775	\$1,244,000,280	\$738,857,892	\$1,982,858,172	\$495,714,543	12,623

Source: San Luis Obispo County Planning and Building Dept., Assessor's Office, ParcelQuest, Wood Plc Parcel Analysis

Insurance Coverage, Claims Paid, and Repetitive Losses

The City of Paso Robles has been a participant in the National Flood Insurance Program since 1981, and will continue to participate and remain in compliance with the National Flood Insurance Program (NFIP).

Table E.14 City of Paso Robles NFIP Insurance Policy Information

Policies	Insurance in Force	No. of Paid Losses	Total Losses Paid
65	\$18,517,800	5	\$50,642

Source: FEMA National Flood Insurance Program Community Information System

FEMA Community Information System shows that as of April 2019 the City of Paso Robles does not have any Repetitive Loss (RL) or Severe Repetitive Loss (SRL) properties. Paso Robles does not participate in the Community Rating System (CRS).



Critical Facilities at Risk

None of the City's identified critical facilities are located in the 1% Annual (100 year) Floodplain. Critical facilities located in the 0.2% Annual (500-year) Floodplain are shown in the following table.

Table E.15 City of Paso Robles Critical Facilities in the 0.2% (500-year) Floodplain

Facility Type	Counts
Colleges / Universities	1
Day Care Facilities	11
Emergency Medical Service Stations	1
Fire Stations	1
Local Law Enforcement	1
Microwave Service Towers	6
Nursing Homes	2
Private Schools	3
Public Schools	9
Energy Commission Facilities	1
Water Treatment Facilities	1
TOTAL	37

Source: San Luis Obispo County Planning & Building, HIFLD 2017

Landslides and Debris Flow

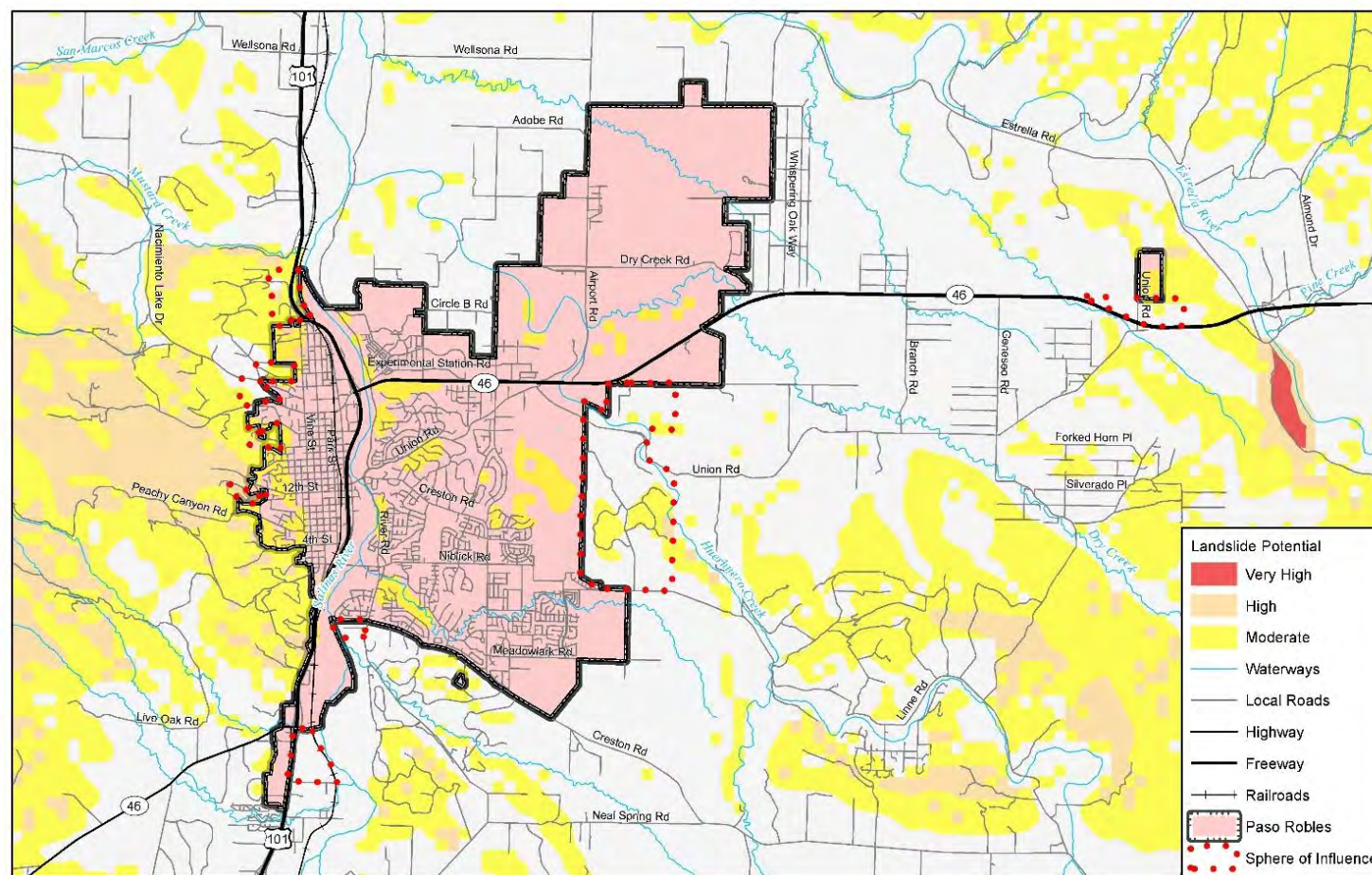
In the past twenty-five years, there have been two notable landslide events in Paso Robles. In 1995 a landslide on a hillside west of Olive Street (just north of Hilltop Drive) slid into the back of two homes after a series of winter storms. The hillside area that slid was approximately 150 wide by 40 feet high, and the slope of the hillside was about 30 percent.

December 22, 2003, numerous small landslides occurred as a result of the San Simeon Earthquake. Particularly noticeable, was a landslide along State Routes 46 and 41, east and west of downtown. The larger surficial slides were observed in the Franciscan Formation along State Route 46. Surficial slides were also observed along River Road in Paso Robles.





Figure E.6 City of Paso Robles Landslide Risk



Map compiled 6/2019;
intended for planning purposes only.
Data Source: San Luis Obispo County,
US Census TIGER Database, CA Open
Data Portal, BLM/California State Office, LAFCO



Paso Robles has 861 properties and 11 critical facilities at high or moderate risk of landslides, as shown in the following tables.

Table E.16 Paso Robles Properties at High Risk of Landslide

Property Type	Property Count	Improved Value
Residential	7	\$2,327,397
Multi-Family Residential	4	\$805,413
Vacant	1	\$38,500
TOTAL	12	\$3,171,310

Source: San Luis Obispo County Planning and Building Dept., Assessor's Office, ParcelQuest, Wood Plc Parcel Analysis

Table E.17 Paso Robles Properties at Moderate Risk of Landslide

Property Type	Property Count	Improved Value
Agricultural	1	\$17,828,970
Commercial	4	\$10,816,442
Government/Utilities	23	--
Other/Exempt/Misc.	23	\$8,370,189
Residential	755	\$181,139,095
Multi-Family Residential	35	\$6,912,732
Vacant	8	\$1,218,988
TOTAL	849	\$226,286,416

Source: San Luis Obispo County Planning and Building Dept., Assessor's Office, ParcelQuest, Wood Plc Parcel Analysis

Table E.18 Paso Robles Critical Facilities at Risk from Landslide

Critical Facility Type	Count	Risk
Microwave Service Towers	2	Moderate
Public Schools	9	Moderate
TOTAL	11	

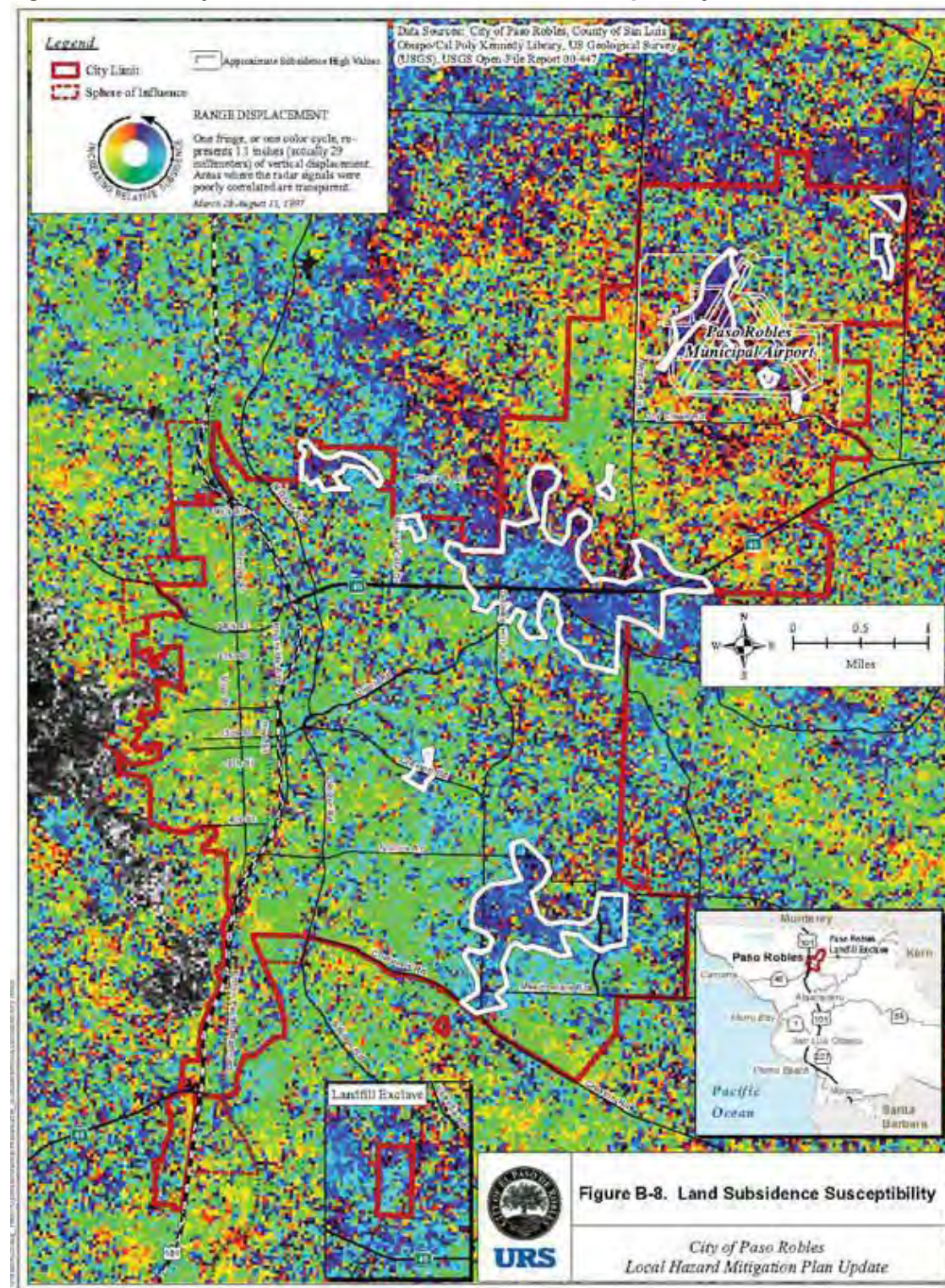
Source: San Luis Obispo County Planning & Building, HIFLD 2017

Subsidence

As shown in Figure E.5, Paso Robles has 1.90 square miles of subsidence-prone areas along the Salinas River and Huerhuero Creek, as well as in the east and especially, southeast portions of the City.



Figure E.7 City of Paso Robles' Land Subsidence Susceptibility





Wildfire

Wildfire is a high significance hazard for the City of Paso Robles. Paso Robles has three properties and two critical facilities located in High Severity SRA Zones, as shown in Table E.11. The City does not have any parcels in Very High or Moderate Severity zones. While the number of properties in the City itself is relatively low, the City is almost completely surrounded by high and very high severity zones, as shown in the following map.

Fire seasons have grown longer and more intense in recent years, testing the City's firefighting resources and community resilience. Using weather factors such as wind, humidity and temperature, severe fire weather occurs greater than 46 days per year, in and around the City of Paso Robles.

Many areas throughout the City are highly susceptible to large conflagrations. One area of high concern is the Salinas Riverbed corridor. The riverbed corridor encompasses over 680 acres, much of it heavily forested. The brush and dead fuels provide a significant source of fuel not able to be addressed by annual weed abatement activities, due to restrictive regulations.

Emergency Response personnel responded to 115 fires in the riverbed corridor in 2018. From January 1-June 30, 2019, Emergency Response personnel responded to 63 fires. Thus, the risk of fire in the riverbed jumping out of the bed and racing through the rest of the community is unacceptably high. Fires in the riverbed corridor threaten critical City infrastructure, nearby residential and commercial properties, and the health and safety of all residents and visitors in the area. On July 16, 2019, the City of Paso Robles proclaimed a local emergency related to the riverbed fires.

High density of wildland fire ignitions are observable within and adjacent to the City of Paso Robles. These notable concentrations are illustrated in Figure E.8.

Figure E.8 Ignition Density in the Paso Robles Area

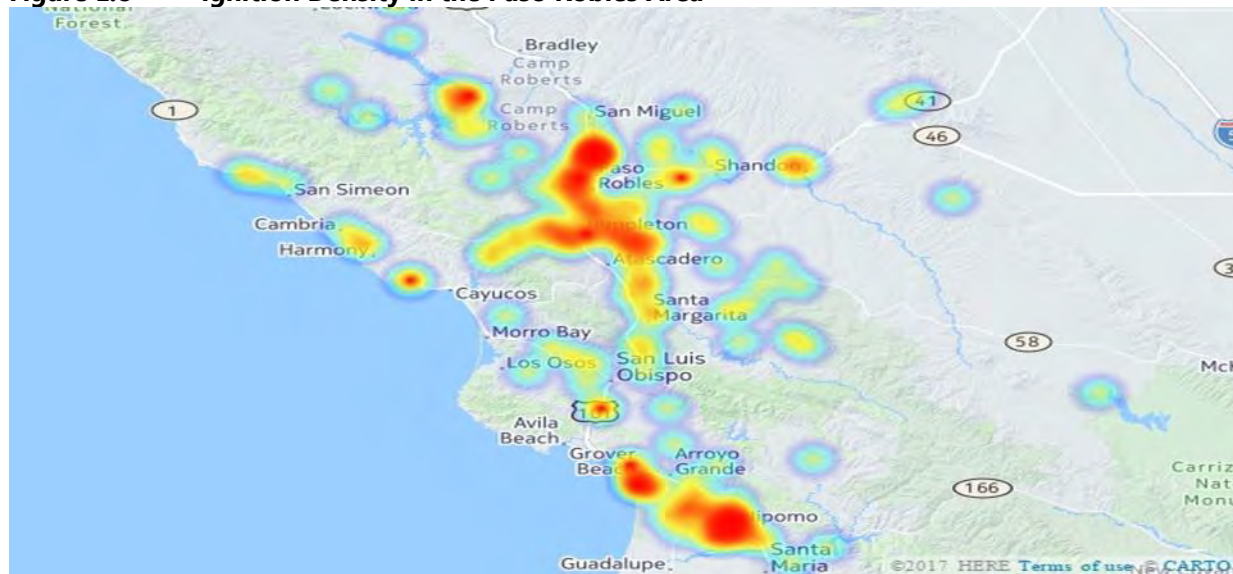
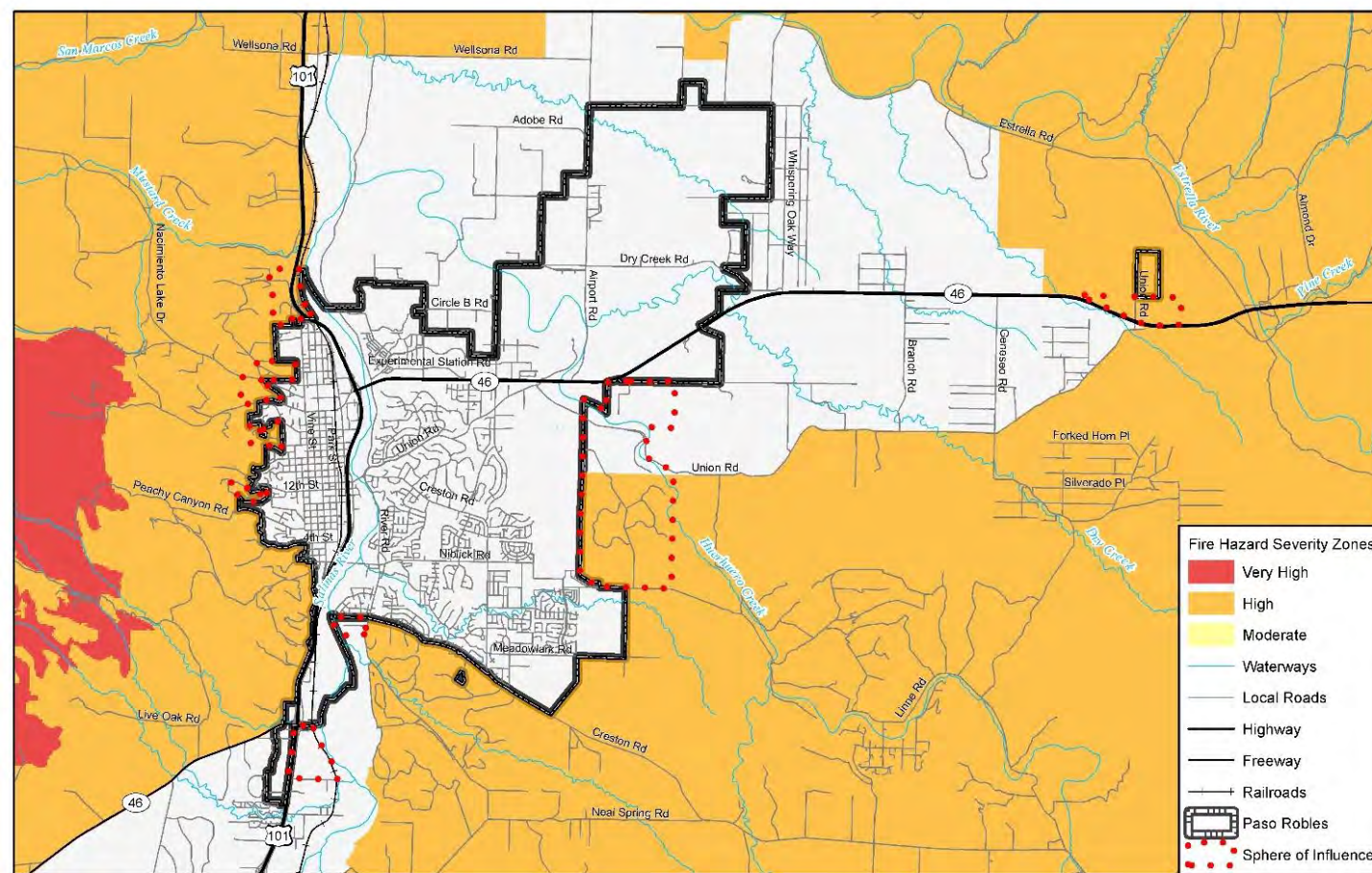




Figure E.9 Fire Hazard Severity Zones in the Paso Robles Area



**Table E.19 City of Paso Robles Properties in High Severity SRA Zones**

Property Type	Parcel Count	Improved Value	Content Value	Total Value	Loss Estimate	Population
Government/Utilities	1	--	--	\$0	\$0	--
Residential	1	\$262,567	\$131,284	\$393,851	\$393,851	3
Multi-Family Residential	1	\$75,478	\$37,739	\$113,217	\$113,217	3
TOTAL	3	\$338,045	\$169,023	\$507,068	\$507,068	6

Source: San Luis Obispo County Planning and Building Dept., Assessor's Office, ParcelQuest, Wood Plc Parcel Analysis

Table E.20 Paso Robles Critical Facilities at Risk from Wildfire

Critical Facility Type	Count	Risk
Microwave Service Towers	2	High
TOTAL	2	

Source: San Luis Obispo County Planning & Building, HIFLD 2017

Human Caused: Hazardous Materials

The Cal OES Warning Center reports 123 hazardous materials incidents in the City of Paso Robles from 1994 through October 24, 2018; as noted in subsection 5.3.16 of the County plan, this likely excludes a large number of unreported minor spills. This constitutes 7% of the hazardous materials incidents reported county-wide during the same time frame, and averages out to roughly 4.9 incidents per year. As noted in subsection 5.3.16, only around 6% of reported hazardous materials incidents result in injuries, fatalities, or evacuations.

As shown in Figure 5-84 in the Base Plan, there are three EPA Risk Management Plan (RMP) facilities and five CalARP regulated facilities located in the City.

E.4 Capability Assessment

Capabilities are the programs and policies currently in use to reduce hazard impacts or that could be used to implement hazard mitigation activities. This capabilities assessment is divided into five sections: regulatory mitigation capabilities, administrative and technical mitigation capabilities, fiscal mitigation capabilities, mitigation outreach and partnerships, and other mitigation efforts.

To develop this capability assessment, the jurisdictional planning representatives used a matrix of common mitigation activities to inventory which of these policies or programs were in place. The team then supplemented this inventory by reviewing additional existing policies, regulations, plans, and programs to determine if they contributed to reducing hazard-related losses.

During the plan update process, this inventory was reviewed by the jurisdictional planning representatives and Wood consultant team staff to update information where applicable and note ways in which these capabilities have improved or expanded. Additionally, in summarizing current capabilities and identifying gaps, the jurisdictional planning representatives also considered their ability to expand or improve upon existing policies and programs as potential new mitigation strategies. The City of Paso Robles's capabilities are summarized below.



E.4.1 Regulatory Mitigation Capabilities

Table E.21 City of Paso Robles Regulatory Mitigation Capabilities

Regulatory Tool	Yes/No	Comments
General plan	Yes	Current General Plan on City Website
Zoning ordinance	Yes	Updated September 2018
Subdivision ordinance	Yes	See City Website.
Growth management ordinance	Yes	See City Website
Floodplain ordinance	Yes	Floodplain Management Ordinance (2008)
Other special purpose ordinance (stormwater, water conservation, wildfire)	Yes	Hazardous Fuels Reduction Ordinance (2019) Storm Water Management Ordinance (2013)
Building code	Yes	2016 California Building Code, Title 17 Municipal Code (See Website)
Fire department ISO rating	Yes	ISO Rating 03/3X
Building Department ISO Rating	Yes	ISO Rating 2/3
Erosion or sediment control program	Yes	Ongoing Public Works/ Development Review Process
Stormwater management program	Yes	Public Works
Site plan review requirements	Yes	Ongoing Development Review Process
Capital improvements plan	Yes	Revolving Five Year Program
Economic development plan	No	
Local emergency operations plan	Yes	EOC Emergency Plan and Annexes
Other special plans	No	
Flood Insurance Study or other engineering study for streams	Yes	FEMA LOMR by project when applicable, City Engineer
Elevation certificates (for floodplain development)	Yes	FEMA/ Floodplain Development requirements ongoing, City Engineer

E.4.2 Administrative/Technical Mitigation Capabilities

Table E.22 identifies the personnel responsible for activities related to mitigation and loss prevention in Paso Robles.



**Table E.22 City of Paso Robles Administrative/Technical Mitigation Capabilities**

Personnel Resources	Yes/ No	Department/ Position	Comments
Planner/engineer with knowledge of land development/land management practices	Yes	Community Development Department (Planning Division)	Develops and maintains the General Plan, Including the Safety Element. Develops area plans based on the General Plan, to provide more detailed guidance for the development of more specific areas. Reviews private development projects and proposed capital improvements projects and other physical projects involving property for consistency and conformity with the General Plan. Anticipates and acts on the need for new plans, policies, and Code changes. Applies the approved plans, policies, code provisions, and other regulations to proposed land uses.
Engineer/professional trained in construction practices related to buildings and/or infrastructure	Yes	Community Development Department (Building Division)	Oversees the effective, efficient, fair, and safe enforcement of the California Building Code.
Planner/engineer/scientist with an understanding of natural hazards	Yes	Community Development (Building and Engineering Divisions)	Reviews Grading and Building Plans to ensure that development is in compliance with existing policies and codes relating to mitigation of natural hazards.
Personnel skilled in GIS	Yes	Administrative Services GIS	
Full time building official	Yes	Community Development Department/Building Official	
Floodplain manager	Yes	Community Development Department (Engineering Division)	Reviews and ensures that new development proposals do not increase flood risk, and that new developments are not located below the 100-year flood level. In addition, the Floodplain Administrator is responsible for planning and managing flood risk reduction projects throughout the City.
Emergency manager	Yes	Emergency Services (Fire Chief)	Coordinates local response and relief activities within the Emergency Operation Center, and works closely with county, state, and federal partners to support planning and training and to provide information and coordinate assistance.
Grant writer	Yes	Emergency Services	
Other personnel			





Personnel Resources	Yes/ No	Department/ Position	Comments
GIS Data Resources (Hazard areas, critical facilities, land use, building footprints, etc.)	Yes	GIS	
Warning Systems/Services (Reverse 9-11, cable override, outdoor warning signals)	Yes	Reverse 911 and EAS activated through Sherriff's Department	
Procurement Services Manager	Yes	Administrative Services	Provides a full range of municipal financial services and administers several licensing measures.

E.4.3 Fiscal Mitigation Capabilities

Table E.23 identifies financial tools or resources that the City could potentially use to help fund mitigation activities.

Table E.23 City of Paso Robles Fiscal Mitigation Capabilities

Financial Resources	Accessible/ Eligible to Use (Yes/No)	Comments
Community Development Block Grants	N	
Capital improvements project funding	Y	
Authority to levy taxes for specific purposes	Y	
Fees for water, sewer, gas, or electric services	Y	
Impact fees for new development	Y	
Incur debt through general obligation bonds	Y	
Incur debt through special tax bonds	Y	
Incur debt through private activities	N	
Withhold spending in hazard prone areas	N	

E.4.4 Mitigation Outreach and Partnerships

The City conducts several ongoing public education or information programs, such as for fire safety, disaster preparedness, wildland preparedness, responsible water use, FOG (fats, oils and greases), and storm water public education.

E.4.5 Other Mitigation Efforts

Other mitigation efforts the City has conducted include:

- Riverbed Hazardous Fuels Reduction Program
- Weed Abatement Program
- Fuel Breaks
- Un-reinforced Masonry Building Retrofit Ordinance (retrofits completed)





E.4.6 Opportunities for Enhancement

Based on the capabilities assessment, the City of Paso Robles has several existing mechanisms in place that already help to mitigate hazards. In addition to these existing capabilities, there are also opportunities for the City to expand or improve on these policies and programs to further protect the community. Future improvements may include providing training for staff members related to hazards or hazard mitigation grant funding in partnership with the County and Cal OES. Additional training opportunities will help to inform City staff members on how best to integrate hazard information and mitigation projects into their departments. Continuing to train City staff on mitigation and the hazards that pose a risk to the City of Paso Robles will lead to more informed staff members who can better communicate this information to the public.

E.5 Mitigation Strategy

E.5.1 Mitigation Goals and Objectives

The City of Paso Robles Planning Team determined the two goals from the 2014 HMP continue to be appropriate for this plan update. The following are the City of Paso Robles's 2019 mitigation goals and objectives:

Goal 1 – Minimize loss of life, injury, and damage to property, the economy, and the environment from the hazards identified in the 2016 LHMP.

Goal 2 – Build and enhance local mitigation capabilities to reduce the hazards identified in the 2016 LHMP. This will help ensure individual safety, reduce damage to public and private buildings and guarantee continuity of emergency services.

Continued Compliance with the National Flood Insurance Program

The City has been an NFIP participating community since 1981. In addition to the mitigation actions identified herein the City will continue to comply with the NFIP. This includes ongoing activities such as enforcing local floodplain development regulations, including issuing permits for appropriate development in Special Flood Hazard Areas and ensuring that this development mitigated in accordance with the regulations. This will also include periodic reviews of the floodplain ordinance to ensure that it is clear and up to date and reflects new or revised flood hazard mapping.

E.5.2 Completed 2016 Mitigation Actions

During the 2019 planning process the City of Paso Robles Planning Team reviewed all the mitigation actions from the 2016 plan. During the 2019 planning process the Planning Team identified that of their fifteen (15) mitigation actions from 2016, thirteen (13) were deferred and two (2) of the actions are in progress demonstrating the ongoing progress of building the community's resiliency to disasters.

E.5.3 Mitigation Actions

The planning team for the City of Paso Robles identified and prioritized the following mitigation actions based on the risk assessment. Background information and information on how each action will be implemented and administered, such as ideas for implementation, responsible office, potential funding, estimated cost, and timeline, are also included. Actions were prioritized using the process described in subsection 7.2.1 of the Base Plan. Actions with an '*' are those that mitigate losses to future development.



**Table E. 24 City of Paso Robles 's Mitigation Action Plan**

ID	Hazard(s) Mitigated	Description/Background/Benefits	Lead Agency and Partners	Cost Estimate	Potential Funding	Priority	Timeline	Status/ Implementation Notes
PR.1*	Drought, Flood, Landslide, Wildfire, Subsidence	Integrate the hazard analysis and mitigation strategy into the General Plan's Safety Element.	CMO	Little to no cost	Staff Time/Dept. Budget	Low	TBD	Deferred
PR.2*	Flood, Landslide, Wildfire, Subsidence	Create a GIS-based pre-application review for new construction and major remodels in hazard areas, such high wildfire severity zones, moderate landslide susceptibility areas, and dam failure inundation zones.	Community Development Department/ Department of Emergency Services	Less than \$10,000	FEAM HMA/Staff Time/Dept. Budget	Low	3-5 yrs.	Deferred
PR.3	Flood, Landslide, Wildfire	Establish a county evacuation and re-population plan. Make sure this plan works with other municipalities so that people are not receiving conflicting information about where to evacuate to. Benefit: Reduce death and injury; organized and systemic approach to evacuation of area with predesignated locations on where to go	Emergency Services Department	Less than \$10,000	General fund; FEMA HMA	High	1 yr.	New
PR.4	Dam Failure	Develop a public outreach program that informs property owners located in the dam inundation areas about voluntary flood insurance.	Public Works Department	Little to no cost	Staff Time/Dept. Budget	Low	2-3 yrs.	Deferred
PR.5	Drought	Develop a drought contingency plan to provide an effective and systematic means of assessing drought conditions, develop mitigation actions and programs to reduce risks in advance of drought, and develop response options that minimize hardships during drought.	Public Works Department	\$10,000 to \$50,000	FEMA HMA	High	3-5 yrs.	Deferred
PR.6	Drought	Develop measures to achieve a higher level of irrigation efficiency with respect to plant water requirements, through assistance programs to customers.	Public Works Department	Little to no cost	Staff Time/Dept. Budget	Low	2-3 yrs.	Deferred



ID	Hazard(s) Mitigated	Description/Background/Benefits	Lead Agency and Partners	Cost Estimate	Potential Funding	Priority	Timeline	Status/ Implementation Notes
PR.7	Extreme Heat	Initiate an extreme heat public awareness and educational campaign to discuss the dangers of extreme heat, steps each individual can personally take during periods of extreme heat and ways to reduce energy consumption during periods of extreme heat.	Emergency Services Department	Little to no cost	Staff Time/Dept. Budget	Low	1 yr.	Deferred
PR.8	Flood	Acquire, relocate, elevate, and/or floodproof public works critical facilities that are located within the 100-year floodplain.	Public Works Department	\$500,000 to \$1,000,000	FEMA HMA	High	More than 5 yrs.	Deferred
PR.9	Flood	Reinforce roads from flooding through protection activities, including elevating the road and installing/widening culverts beneath the road or upgrading storm drains.	Public Works Department	\$500,000 to \$1,000,000	FEMA HMA	High	More than 5 yrs.	Deferred
PR.10	Flood	Develop a public outreach program that educates property owners about voluntary flood insurance (targeted at areas that historically flood, but are not acknowledged on FEMA flood insurance rate maps)	Public Works Department	Little to no cost	Staff Time/Dept. Budget	Low	2-3 yrs.	Deferred
PR.11	Flood	Partner with propane companies and regulating agencies to secure tanks located in special flood hazard areas.	Emergency Services Department	Little to no cost	Staff Time/Dept. Budget	Low	1 yr.	Deferred
PR.12	Flood	Increase participation in the NFIP by entering the Community Rating System program which through enhanced floodplain management activities would allow property owners to receive a discount on their flood insurance.	Public Works Department	Little to no cost	Staff Time/Dept. Budget	Low	1 yr.	Deferred
PR.13	Hazardous Materials	Continue to monitor the manufacture, storage, and transport of hazardous materials by working with environmental health and public safety agencies to identify effective mitigation actions or requirements that will help reduce the risk of incidents, including the spread of released materials.	Emergency Services Department	Little to no cost	Staff Time/Dept. Budget	Low	Ongoing	Deferred





ID	Hazard(s) Mitigated	Description/Background/Benefits	Lead Agency and Partners	Cost Estimate	Potential Funding	Priority	Timeline	Status/ Implementation Notes
PR.14 *	Multi: Landslide, Subsidence	Establish local zoning regulations that require the stabilization of landslide-prone areas and land subsidence hazard areas before new development can occur, through stability improvement measures such as the inclusion of interceptor drains, in-situ soil piles, drained earth buttresses, and subdrains.	Community Development Department	Little to no cost	Staff Time/Dept. Budget	Low		Completed on an ongoing basis
PR.15	Wildfire	Create a new vegetation management program that provides vegetation management services to elderly, disabled, or low-income property owners who lack the resources to remove flammable vegetation from around their homes.	Emergency Services Department	Less than \$10,000	FEMA HMA	High	3-5 yrs.	Deferred
PR.16 *	Wildfire	Implement a fuel modification program for new construction by requiring builders and developers to submit their plans, complete with proposed fuel modification zones, to the local fire department for review and approval prior to beginning construction.	Community Development Department/ Emergency Services Department	Less than \$10,000	FEMA HMA	High	2-3 yrs.	In progress
PR.17	Wildfire	Ability to fast track cleanup efforts in the Salinas Riverbed with approvals through Fish and Wildlife, or other agencies involved in environmentally sensitive areas	Emergency Services Department	Less than \$10,000	General funds; FEMA HMA	High	1 yr.	New
PR.18	Earthquake	Implement Digital "Collector" App for damage inspection program (DINS)	Information Technology (GIS)	Already Purchased	General Fund	Medium	2 Years	New
PR.19	Earthquake	Implement Applied Technology Council Placards and Evaluation Forms	Community Development Department	Little to No Cost	General Fund	Medium	2 Years	New
PR.20	Earthquake	Develop an inventory of public and community building that may be particularly vulnerable to earthquake damage, including pre-1940's homes and with cripple wall foundations	Information Technology (GIS)	Little to No Cost	General Fund	Medium	2 Years	New





ID	Hazard(s) Mitigated	Description/Background/Benefits	Lead Agency and Partners	Cost Estimate	Potential Funding	Priority	Timeline	Status/ Implementation Notes
PR.21	Adverse Weather: Thunderstorm/ Heavy Rain/Hail/Lightning/Dense Fog/Freeze/ High Wind	Through newsletters, advertisements, speaking engagements and other public contacts, educate the general public and key stakeholders on the issues, responsibilities, and current efforts and successes in the area of hazard mitigation and disaster preparedness related to adverse weather.	Community Development Department/ Emergency Services Department	Little to no cost	General Fund	Medium	Annual	New





E.6 Implementation and Maintenance

Moving forward, the City will use the mitigation action table in the previous section to track progress on implementation of each project. As illustrated in subsection 7.3.1 of the County plan, much progress has been made since the plan was originally developed. Implementation of the plan overall is discussed in Section 8 of the main plan.

E.6.1 Incorporation into Existing Planning Mechanisms

The information contained within this plan, including results from the Vulnerability Assessment, and the Mitigation Strategy will be used by the City to help inform updates and the development of local plans, programs and policies. The Engineering Division may utilize the hazard information when implementing the City's Community Investment Program and the Planning and Building Divisions may utilize the hazard information when reviewing a site plan or other type of development applications. The City will also incorporate this LHMP into the Safety Element of their General Plan, as recommended by Assembly Bill (AB) 2140.

As noted in Section 8 Plan Implementation, the HMPC representatives from Paso Robles will report on efforts to integrate the hazard mitigation plan into local plans, programs and policies and will report on these efforts at the annual HMPC plan review meeting.

E.6.2 Monitoring, Evaluation and Updating the Plan

The City will follow the procedures to monitor, review, and update this plan in accordance with San Luis Obispo County as outlined in Section 8 of the Base Plan. The City will continue to involve the public in mitigation, as described in subsection 8.3 of the Base Plan. The Fire Chief will be responsible for representing the City in the County HMPC, and for coordination with City staff and departments during plan updates. The City realizes it is important to review the plan regularly and update it every five years in accordance with the Disaster Mitigation Act Requirements as well as other State of California requirements.





F.1 Community Profile

F.1.1 Mitigation Planning History and 2019 Process

This annex was created during the development of the 2019 San Luis Obispo County Hazard Mitigation Plan update. This Jurisdictional Annex builds upon the previous version of the Local Hazard Mitigation Plan for the City of Pismo Beach, which was completed and adopted by the City Council on July 15, 2014 and approved by FEMA in June 2015. That previous mitigation plan was not incorporated into the City's General Plan, Public Information and Outreach, Capital Improvement Plan, and Emergency Operations Plan; however this updated mitigation plan will be referenced in those documents and referenced in the update of the City's Local Coastal Plan. A review of jurisdictional priorities found no significant changes in priorities since the last update.

The City's Local Planning Team (LPT) held responsibility for implementation and maintenance of the plan. The Associate Planner for City of Pismo Beach is responsible for updating the plan.

Table F.1 Pismo Beach Hazard Mitigation Plan Revision Planning Group

Department or Stakeholder	Title
Community Development -Planning Division	Community Development Director
Community Development -Planning Division	Associate Planner
Fire Department (CAL FIRE)	Captain – Prevention
Public Works – Engineering Division	Public Works Director

More details on the planning process followed and how the jurisdictions, service districts, and stakeholders participated can be found in Section 3 of the Base Plan, as well as how the public was involved during the 2019 update.

F.1.2 Geography and Climate

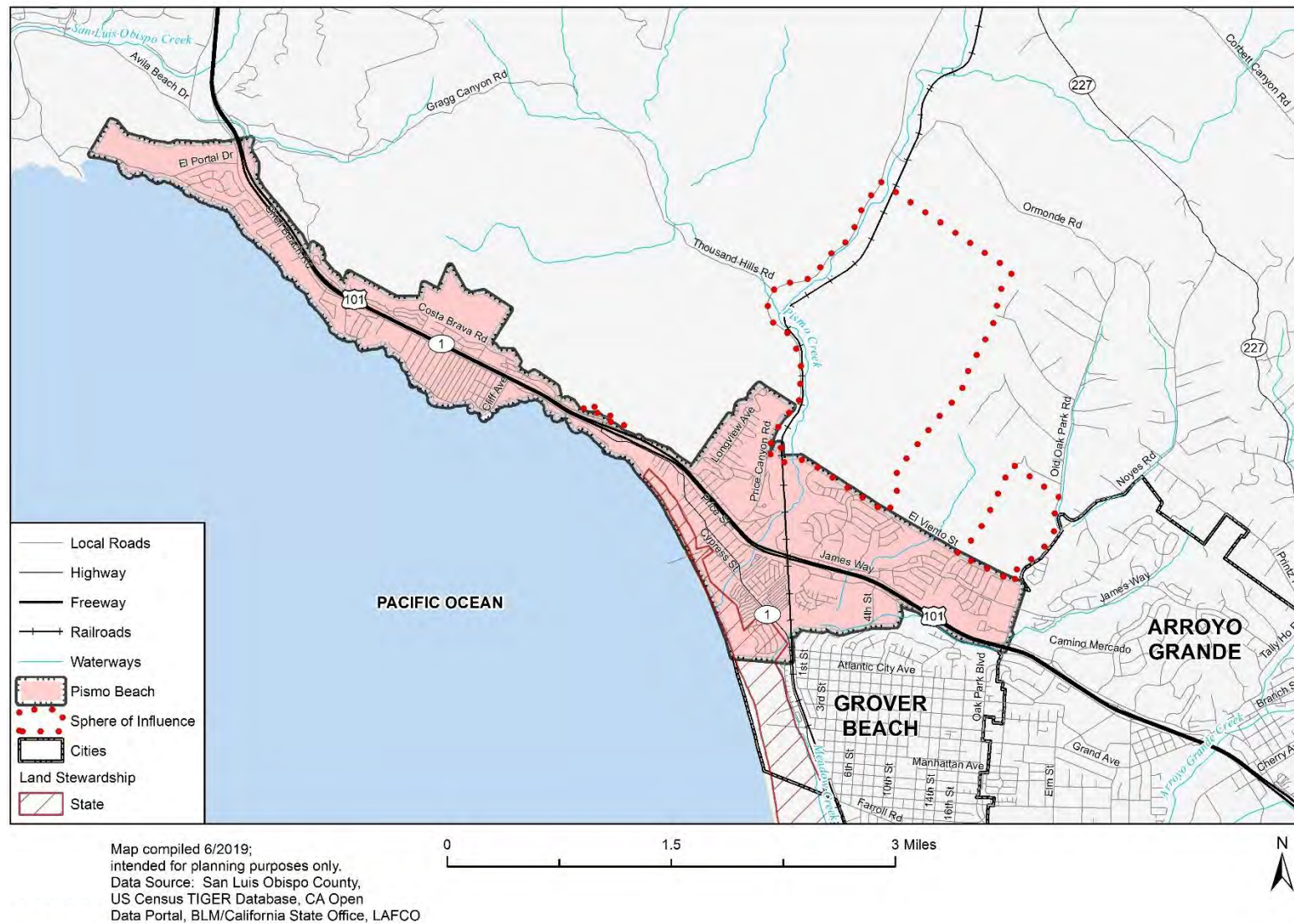
The City of Pismo Beach is a coastal community located in the south county area of the San Luis Obispo. U.S. Highway 101 traverses the City limits along the Pacific Ocean. The City of Pismo Beach, encompassing 3.6 miles, is one of the communities in the area known as the Five Cities. The Cities of Grover Beach and Arroyo Grande border Pismo Beach on the south, and the unincorporated community of Avila Beach borders Pismo Beach to the North. The City of Pismo Beach has varying topography with elevations ranging from 0 feet above mean sea level (msl) to 600 feet msl, as can be seen from the community's sandy beaches and sand dune to cliffs and bluffs ranging from 10 to 100 feet in height. Figure F.1 displays a map and the location within San Luis Obispo County of the City of Arroyo Grande planning area.

According to the Western Regional Climate Center, Pismo Beach has an average high temperature (June) of 70°F and low temperature of 42°F (January). The jurisdiction receives 17.14 inches of rain annual. While the average temperature is relatively temperate, summer and winter months bring unique weather patterns to the region.





Figure F.1 The City of Pismo Beach





F.1.3 History

The City of Pismo Beach consists of 3.6 square miles of the original 13.8 square miles of Rancho Pismo. The historic Pismo Beach was founded in 1840 by Jose Ortega and was purchased by John Price in the mid-1850's. Price hired a surveyor to plan and plat a town which would be known as "El Pismo". The town consisted of a wharf, warehouse, school districts, post office, and beach hotel, and quickly establishing itself as a tourist destination. The original town site of El Pismo continues to be the downtown area of the City. The community changed the its name from "El Pismo" to "Pismo Beach" in 1923. Tourism continued to be a draw to Pismo Beach as the community-built tourist attractions such as the pier at Pismo Beach, which continues to be an attraction to this day. In 1926 the community attempted to incorporate but was unsuccessful until 1939. The following year, in 1940 with fears of increased taxes under the newly incorporated City, the Community voted to disincorporate the City. The City was again incorporated on April 25, 1946. Shell Beach was annexed into the City of Pismo Beach in 1964 followed by the annexation of Sunset Palisades in 1970.

F.1.4 Economy

The City of Pismo Beach has a robust economy that's been built around the tourism and retail industries. The 5-year estimates (2013-2017) from the U.S. Census Bureau's American Community Survey show the majority of those employed work in the educational services and health care and social assistance industry (23%); arts, entertainment and recreation and accommodation and food services (17%); professional, scientific and management (13%); and retail trade (11%). Refer to Table F.3 below for a complete breakdown of the labor force by industry, based on the estimate from the 2013-2017 five-year American Community Survey.

Select estimates of economic characteristics for the City of Pismo Beach are shown in Table F.2.

Table F.2 City of Pismo Beach Economic Characteristics, 2013-2017

Characteristic	City of Pismo Beach
Families below Poverty Level (%)	2.2%
All People below Poverty Level (%)	8.4%
Median Family Income	\$90,069
Median Household Income	\$77,316
Per Capita Income	\$50,762
Population in Labor Force	4,175
Population Employed*	4,012
Unemployment	163

Source: CA Department of Finance U.S. Census Bureau American Community Survey 2013-2017 5-Year Estimates, www.census.gov/

*Excludes armed forces

**Table F.3 City of Pismo Beach Employment by Industry, 2013-2017**

Industry	# Employed
Agriculture, forestry, fishing and hunting, and mining	55
Construction	186
Manufacturing	77
Wholesale trade	442
Retail trade	174
Transportation and warehousing, and utilities	47
Information	252
Finance and insurance, and real estate and rental and leasing	560
Professional, scientific, and management, and administrative and waste management services	953
Educational services, and health care and social assistance	716
Arts, entertainment, and recreation, and accommodation and food services	221
Other services, except public administration	201
Public Adm	55
Total	4,012

Source: U.S. Census Bureau American Community Survey 2013-2017 5-Year Estimates, www.census.gov/

F.1.5 Population

The U.S. Census Bureau estimated the City's 2017 population as 8,060, up from 7,655 at the 2010 census. Table F.4 shows an overview of key social and demographic characteristics of the City taken from the U.S. Census Bureau's American Community Survey.

Table F.4 City of Pismo Beach's Demographic and Social Characteristics, 2012-2017

City of Pismo Beach	2012	2017	% Change
Population	7,721	8,060	4.4%
Median Age	51.3	54.1	5.5%
Total Housing Units	5,290	5,622	6.3%
Housing Occupancy Rate	68.5%	72.6%	4.1%
% of Housing Units with no Vehicles Available	4.9%	6.4%	1.5%
Mean Travel Time to Work (minutes)	4.9%	8.4%	3.5%
# of Households	3,626	4,081	12.5%
Average Household Size	2.13	1.97	-7.5%
% of Population Over 25 with High School Diploma	95.9%	96.3%	0.4%
% of Population Over 25 with Bachelor's Degree or Higher	35.3%	45.2%	9.9%
% with Disability	13.1%	13.1%	0.0%
% Speak English less than "Very Well"	3.7%	2.2%	-1.5%

Source: U.S. Census Bureau American Community Survey 2012-2017 5-Year Estimates, www.census.gov/



F.1.6 Development Trends

A majority of development within the City of Pismo Beach is residential. According to the LPT, the City of Pismo Beach is fairly built out, with vacant properties available to be developed for housing in the Sunset Palisades and Freeway Foothill Planning Areas. Other areas of the City are experiencing infill and redevelopment activity. New hotels near the City Pier have been developed, which the LPT has concerns will expose an increased number of visitors to hazards such as tsunamis. Most of the City is within the Coastal Zone, although as noted in the 2015 LHMP, recent development has extended into the foothills beyond the Coastal Zone. Development within the City falls under two zoning codes: the 1983 zoning codes applies to the Coastal Zone, while the 1998 zoning code applies to properties outside the Coastal Zone.

F.2 Hazard Identification and Summary

The Pismo Beach Planning Team identified the hazards that affect the City and summarized their frequency of occurrence, spatial extent, potential magnitude, and significance specific to Pismo Beach (see Table F.5). There are no hazards that are unique to the City. The overall hazard significance takes into account the geographic area, probability and magnitude as a way to identify priority hazards for mitigation purposes. This is discussed further in the Vulnerability Assessment section below.




Table F.5 City of Pismo Beach – Hazard Summaries

Hazard	Geographic Area	Probability of Future Occurrence	Magnitude/Severity (Extent)	Overall Significance
Coastal Erosion	Significant	Highly Likely	Limited	Medium
Coastal Storm	Limited	Occasional	Limited	Medium
Sea Level Rise	Significant	Occasional	Limited	Medium
Dam Incidents	Limited	Occasional	Critical	Medium
Drought and Water Shortage	Extensive	Likely	Negligible	Medium
Flood	Significant	Likely	Limited	Medium
Earthquake	Extensive	Occasional	Limited	Medium
Landslide	Significant	Likely	Limited	Medium
Tsunami	Significant	Occasional	Critical	Medium
Wildfire	Significant	Occasional	Critical	Medium
Human Caused: Hazardous Materials	Limited	Likely	Limited	Medium
Geographic Area Limited: Less than 10% of planning area Significant: 10-50% of planning area Extensive: 50-100% of planning area Probability of Future Occurrences Highly Likely: Near 100% chance of occurrence in next year or happens every year. Likely: Between 10 and 100% chance of occurrence in next year or has a recurrence interval of 10 years or less. Occasional: Between 1 and 10% chance of occurrence in the next year or has a recurrence interval of 11 to 100 years. Unlikely: Less than 1% chance of occurrence in next 100 years or has a recurrence interval of greater than every 100 years.		Magnitude/Severity (Extent) Catastrophic—More than 50 percent of property severely damaged; shutdown of facilities for more than 30 days; and/or multiple deaths Critical—25-50 percent of property severely damaged; shutdown of facilities for at least two weeks; and/or injuries and/or illnesses result in permanent disability Limited—10-25 percent of property severely damaged; shutdown of facilities for more than a week; and/or injuries/illnesses treatable do not result in permanent disability Negligible—Less than 10 percent of property severely damaged, shutdown of facilities and services for less than 24 hours; and/or injuries/illnesses treatable with first aid Significance Low: minimal potential impact Medium: moderate potential impact High: widespread potential impact		





F.3 Vulnerability Assessment

The intent of this section is to assess Pismo Beach's vulnerability separate from that of the planning area as a whole, which has already been assessed in Section 5 of the Base Plan. This vulnerability assessment analyzes the population, property, and other assets at risk to hazards ranked of medium or high significance, or that may vary from other parts of the planning area.

The information to support the hazard identification and risk assessment was based on the previous LHMP for the City. A Local Hazard Mitigation Plan Update Guide and associated worksheets were distributed to each participating municipality or special district to complete during the 2019 update process. Information collected was analyzed and summarized in order to identify and rank all the hazards that could impact anywhere within the County, as well as to rank the hazards and identify the related vulnerabilities unique to each jurisdiction.

Each participating jurisdiction was in support of the main hazard summary identified in the Base Plan (See Table 5.2). However, the hazard summary rankings for each jurisdictional annex may vary slightly due to specific hazard risk and vulnerabilities unique to that jurisdiction (See Table F.5). Identifying these differences helps the reader to differentiate the jurisdiction's risk and vulnerabilities from that of the overall County.

Note: The hazard "Significance" reflects overall ranking for each hazard, and is based on the City of Pismo Beach's Planning Team member input from the Data Collection Guide and the risk assessment developed during the planning process (see Section 5 of the Base Plan), which included a more detailed qualitative analysis with best available data.

The hazard summaries in Table F.5 reflect the hazards that could potentially affect City. The discussion of vulnerability for each of the following hazards is located in F.3.2 Estimating Potential Losses. Based on this analysis, there are no hazards ranked as High significance. The following hazards were given a Medium significance for the City of Pismo Beach.

- Coastal Storm/Coastal Erosion/Sea Level Rise
- Dam Incidents
- Drought and Water Shortage
- Earthquake
- Flood
- Landslide
- Tsunami
- Wildfire
- Hazardous Materials

Other Hazards

Hazards assigned a significance rating of Low and which do not differ significantly from the County ranking (e.g., Low vs. High) are not addressed further in this plan and are not assessed individually for specific vulnerabilities in this section. In the City of Pismo Beach, those hazards include: adverse weather, agricultural pests and plant diseases, biological agents, debris flow, subsidence, and seiches.

F.3.1 Assets at Risk

This section considers Pismo Beach's assets at risk, including values at risk, critical facilities and infrastructure, historic assets, economic assets and growth and development trends.





Values at Risk

The following data on property exposure is derived from the San Luis Obispo County 2019 Parcel and Assessor data. This data should only be used as a guideline to overall values in the City as the information has some limitations. The most significant limitation is created by Proposition 13. Instead of adjusting property values annually, the values are not adjusted or assessed at fair market value until a property transfer occurs. As a result, overall value information is likely low and does not reflect current market value of properties. It is also important to note that in the event of a disaster, it is generally the value of the infrastructure or improvements to the land that is of concern or at risk. Generally, the land itself is not a loss. Table F.6 shows the exposure of properties (e.g., the values at risk) broken down by property type for the City of Pismo Beach.

Table F.6 2019 Property Exposure for the City of Pismo Beach by Property Types

Property Type	Parcel Count	Improved Value	Content Value	Total Value
Commercial	157	\$114,852,343	\$114,852,343	\$229,704,686
Government/Utilities	80	\$23,467	--	\$23,467
Other/Exempt/Misc.	199	\$13,450,476	--	\$13,450,476
Residential	3,366	\$922,174,106	\$461,087,053	\$1,383,261,159
Multi-Family Residential	851	\$188,228,183	\$94,114,092	\$282,342,275
Mobile/Manufactured Homes	5	\$20,491,650	\$10,245,825	\$30,737,475
Residential: Other	200	\$162,579,999	\$81,290,000	\$243,869,999
Vacant	27	\$17,273,561	--	\$17,273,561
Total	4,885	\$1,439,073,785	\$761,589,312	\$2,200,663,097

Source: Wood Plc analysis based on ParcelQuest and San Luis Obispo County Assessor's Office data 2019

Critical Facilities and Infrastructure

A critical facility may be defined as one that is essential in providing utility or direction either during the response to an emergency or during the recovery operation. See Section 5 of the Base Plan for more details on the definitions and categories of critical facilities.

An inventory of critical facilities in the City of Pismo Beach from San Luis Obispo County GIS is provided in Table F.7 and illustrated in Figure F.2. A more detailed list of the critical facilities was provided by the Planning team that includes the name of the asset, replacement value and hazard specific issues can be found as an Attachment at the end of this Annex.



**Table F.7 City of Pismo Beach's Critical Facilities**

Facility Type	Counts
Day Care Facilities	2
Emergency Medical Service Stations	2
Fire Stations	3
Local Law Enforcement	1
Public Schools	2
Urgent Care	1
Microwave Service Towers	6
Wastewater Treatment Plants	1
Airports	1
Total	19

Source: San Luis Obispo County Planning & Building, HIFLD 2017

Transportation and Lifeline Facilities

The City of Pismo Beach is a "highway-oriented" community, with U.S. Highway 101 traversing through the center of the City along its entire length. There are several bridges within the City limits that cross Highway 101, and which the Planning Team noted as being vulnerable to an earthquake event; in some cases, the bridges are also at risk of other hazards such as tsunami inundation or inundation from the Lopez Dam. In addition to Highway 101 there are two regionally significant roads that cross the City of Pismo Beach: Price Canyon Road and State Road 1. The City's 2015 notes the limited transportation route options as a concern if evacuation was required.

Other transportation facilities within or near the City of Pismo Beach include, Oceano County Airport and the San Luis Obispo County Regional Airport. Both airports are outside the City limits of Pismo Beach but could impact the City of Pismo Beach if these facilities were impacted by a disaster.

There are seven lifeline utility systems within the City of Pismo Beach, including six microwave service towers and one wastewater treatment plant. Based on the GIS analysis there are two microwave service towers that are at moderate to high risk from landslide events. Refer to the landslide section under F.3.2 Estimating Potential Losses.

Emergency Services

Based on the GIS analysis the City of Pismo Beach has eleven emergency services facilities that will be important to remain operable during an emergency or after a disaster. A majority of these emergency services facilities are located near Highway 101. According to the Planning Team, Fire Stations 63 and 64 as well as the Police Annex, and Police Department/EOC are vulnerable to an earthquake event. The two public schools in the City of Pismo Beach, Judkins Middle School, and Shell Beach Elementary as well as the Happy Time Cooperative Preschool are all considered by the Planning Team to be vulnerable to earthquake hazards.

Historic and Cultural Resources

The National Register of Historic Places lists one historic site in the City of Pismo Beach: the John Price House, Also known as the Price Anniversary House, which is the oldest building in Pismo Beach. The Planning Team lists the following resources as community assets for Pismo Beach.





- Ira Lease Park
- Mary Herrington Park
- Old City Hall
- Pismo Beach Pier
- Pismo Veterans' Hall
- Price Anniversary House
- Meherin House
- Price Adobe
- Shell Beach Veterans' Hall

Natural Resources

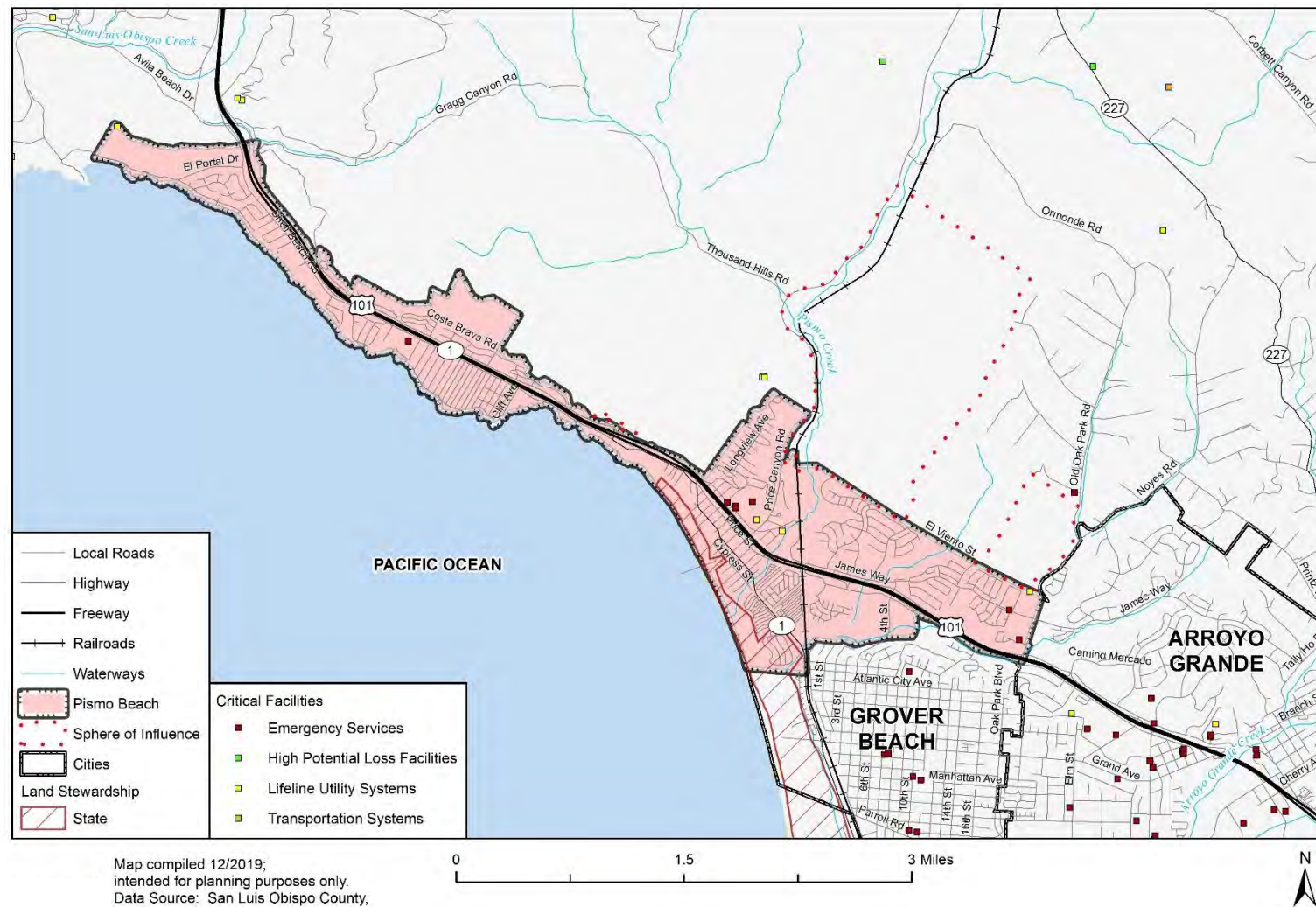
Natural resources are important to include in benefit-cost analyses for future projects and may be used to leverage additional funding for projects that also contribute to community goals for protecting sensitive natural resources. Awareness of natural assets can lead to opportunities for meeting multiple objectives. For instance, protecting the dunes and bluffs along the coast of Pismo Beach is important both for continuing to attract tourists but also as a form of natural protection against coastal storms for the entire community of Pismo Beach. The City of Pismo Beach is home to several parks and natural areas, including the Monarch Butterfly Grove and the Dinosaur Cave Park, which encompasses 11-acres of ocean-front, bluff-top park. The over 900-acre Pismo Preserve is another natural attraction in the City with over 10 miles of existing ranch roads and trails that meander through the Preserve. The Land Conservancy of San Luis Obispo County has been working with the County, San Luis Obispo Council of Governments, and the City of Pismo Beach to fund and construct public amenities for the Pismo Preserve. The Pismo Preserve is currently closed, and initial construction has begun. The Land Conservancy is anticipating opening the Preserve by the end of 2019.

Economic Assets

The local economy for Pismo Beach is oriented around tourism. Many of the historic, cultural and natural resources noted above help to attract visitors to the City. According to the City's Housing Element (2007), the Pismo Beach's primary industries relate to service industry such as lodging, food service, and retail. With tourism being the greatest economic asset, if a disaster event was to occur within or near the City of Pismo Beach there is also a risk of the public's perception of safety after the event that could impact the number of tourists or visitors to the City in the years following the event.



Figure F.2 City of Pismo Beach's Critical Facilities





F.3.2 Estimating Potential Losses

Note: This section details vulnerability to specific hazards of high or medium significance, where quantifiable, and/or where (according to HMPC member input) it differs from that of the overall County.

Table F.6 above shows Pismo Beach's exposure to hazards in terms of number and value of structures. San Luis Obispo County's parcel and assessor data was used to calculate the improved value of parcels. The most vulnerable structures are those unreinforced masonry buildings, and buildings built prior to the introduction of modern-day building codes. Impacts of past events and vulnerability to specific hazards are further discussed below (see Section 5 for more detailed information about these hazards and their impacts on San Luis Obispo County as a whole).

Note: The risk and vulnerability related to biological agents in Pismo Beach do not differ from those of the County at large. Please refer to Section 5 of the Base Plan for more details on this hazard.

Coastal Storm/Coastal Erosion/Sea Level Rise

As a low-lying coastal community Pismo Beach is exposed to a range of coastal hazards, including coastal storms and coastal erosion. As described in the Base Plan (refer to Section 5), these hazards are projected to become more severe when combined with sea level rise.

Coastal storms include tidal flooding, storm surge and wave action, sometimes in combination with high tide and strong winds. Coastal storms can cause high winds and strong storm surges that would affect low-lying "vulnerable" coastal resources and infrastructure located in urban areas. All coastal development in proximity to the shoreline is threatened by landward retreat of the shoreline due to beach and bluff erosion, which are exacerbated by coastal storm events. A coastal storm during the 1982/83 El Niño season caused significant damage to coastal structures at Pismo Beach, including the Pier, RV park, access trail, and seawall. An estimated replacement cost of over \$5.5 million was reported.

The following table shows the parcels by property type that are risk of coastal flooding events.

Table F.8 City of Pismo Beach Coastal Flooding Risk by Property Type

Property Type	Parcel Count	Improved Value	Content Value	Total Value
Government/Utilities	9	--	--	\$0
Other/Exempt/Misc.	1	--	--	\$0
Total	10	\$0	\$0	\$0

Source: Wood Plc analysis based on ParcelQuest and San Luis Obispo County Assessor's Office data 2019

The City of Pismo Beach's topography varies from sandy beaches and sand dunes to cliffs and bluffs ranging from 10 to 100 feet in height along five miles of the northwest portion of the City's shoreline. Erosion of the beach and dunes threaten residential, commercial, and recreational development. There have been several erosion events in the City's history that have caused damage including the following events. Refer to the Adverse Weather profile of Section 5 for additional events that have impacted the Pismo Beach planning area.

1978 – A severe storm led to bluff erosion and resulted in the damage to eight (8) homes.

1998 – Five coastal bluff failures affected City roads. Increased sea-wave erosion, surface-water erosion, and urban irrigation contributed to failures.



2009 and 2011 – Beginnings of bluff failures prompted emergency work to stabilize the impacted areas to prevent the erosion of a frontage road by Highway 1 and damage to the sewage pumping station at Shell Beach.

According to the City of Pismo Beach 1992 Bluff Erosion Study Update, bluff erosion rates average 2 inches per year where bedrock is present in locations such as Park Place, South Point and Price Street. Up to 12 inches per year is possible in areas with limited bedrock such as Indio Drive. The same study states that past studies have found that more than 60 homes are within the bluff retreat hazard zone and may be subject to damage or destruction by 2100, without accounting for accelerated bluff retreat associated with sea level rise. Refer to Section 5 of the Base Plan for additional information, including pictures of past bluff erosion events that have occurred in Pismo Beach

Rising sea levels as a result of climate change are projected to increase the intensity of coastal storms, flooding, inundation, and erosion along the Pismo Beach coast. The areas with the highest potential of experiencing coastal hazards include portions of the City that are either low-lying or located atop eroding coastal bluffs. If sea levels continue to rise at higher projected rates, episodic coastal erosion and coastal flooding impacts that already occur during large storm wave events could become more frequent, as predictable high tides may regularly inundate public beaches and low-lying coastal infrastructure.

As part of the 2019 HMP planning effort, a sea level rise risk assessment was completed to determine how sea level rise may affect coastal jurisdictions and critical facilities and how coastal flooding might be exacerbated in the future. Table F.9 and Table F.10 summarize the properties at risk of inundation by sea level rise and sea level rise combined with a 1% annual chance coastal flood. The area of inundation by sea level rise and sea level rise combined with the 1% coastal flood are shown in Figure F.3 and Figure F.4, respectively. No critical facilities were determined to be at risk in the sea-level rise scenarios. See subsection 5.3.7 Coastal Storm/Coastal Erosion/Sea Level Rise in the base plan for more details on the scenarios and data sources used for this analysis.




Table F.9 Properties Inundated by Sea Level Rise and Sea Level Rise with 1% Annual Chance Flood

Property Type	25-cm SLR	75-cm SLR	300-cm SLR	25-cm SLR w/ 1% Flood	75-cm SLR w/ 1% Flood	300-cm SLR w/ 1% Flood
Commercial	--	--	9	2	4	9
Government/Utilities	1	1	12	4	5	13
Other/Exempt/Misc.	--	1	18	1	6	22
Residential	1	2	37	2	9	41
Multi-Family Residential	--	--	93	--	6	104
Mobile/Manufactured Homes	--	--	3	--	2	3
Residential: Other	--	--	7	--	--	13
Total	2	4	179	9	32	205

Source: Wood analysis with USGS CoSMoS 3.1 data

Table F.10 Improved Values of Properties Inundated by Sea Level Rise and Sea Level Rise with 1% Annual Chance Flood

Property Type	25-cm SLR	75-cm SLR	300-cm SLR	25-cm SLR w/ 1% Flood	75-cm SLR w/ 1% Flood	300-cm SLR w/ 1% Flood
Commercial	--	--	\$3,931,762	\$255,000	\$330,726	\$3,931,762
Government/Utilities	--	--	--	--	--	--
Other/Exempt/Misc.	--	\$2,214,828	\$3,727,316	\$2,214,828	\$2,349,497	\$3,727,316
Residential	\$174,047	\$176,839	\$6,468,297	\$176,839	\$3,056,157	\$6,933,545
Multi-Family Residential	--	--	\$55,908,703	--	\$1,255,367	\$24,617,998
Mobile/Manufactured Homes	--	--	\$17,059,909	--	\$16,215,406	\$17,059,909
Residential: Other	--	--	\$13,124,415	--	--	\$17,033,080
Total	\$174,047	\$2,391,667	\$67,220,402	\$2,646,667	\$23,207,153	\$73,303,610

Source: Wood analysis with USGS CoSMoS 3.1 data



Figure F.3 Pismo Beach Sea Level Rise Scenario Analysis: Tidal Inundation Only

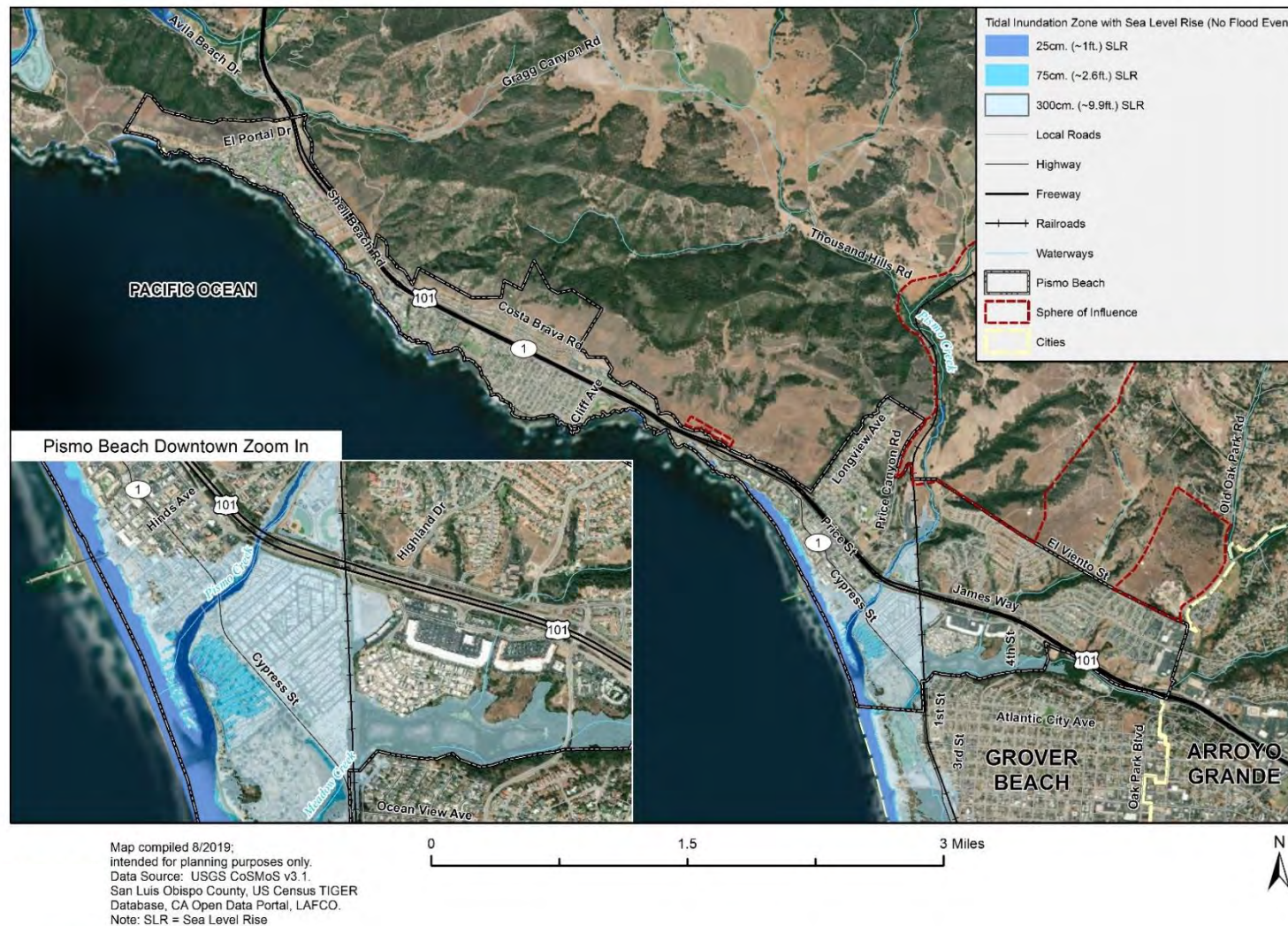


Figure F.4 Pismo Beach Sea Level Rise Scenario Analysis: Tidal Inundation and 1% Annual Chance Flood





Dam Failure

The City of Pismo Beach is among the most vulnerable communities in San Luis Obispo at risk of a dam failure incident. The Lopez Dam, a high hazard earthen dam located upstream from the community, poses the greatest risk to Pismo Beach if an incident was to occur. Failure of the Lopez Dam would inundate areas within the southern portion of the City limits. A total of 113 persons and 66 properties in the City of Pismo Beach could be inundated if the Lopez Dam was to fail. Most of the properties impacted would be residential (45, including 2 mobile homes) located in the southern portion of the City. Refer to the Dam Inundation Estimate Losses by Jurisdiction and Dam table in Section 5 of the Base Plan for additional details on estimated losses in Pismo Beach and for additional discussion on the potential impacts of dam incidents in the County.

Table F.11 Lopez Dam Inundation Estimate Losses by Property Type

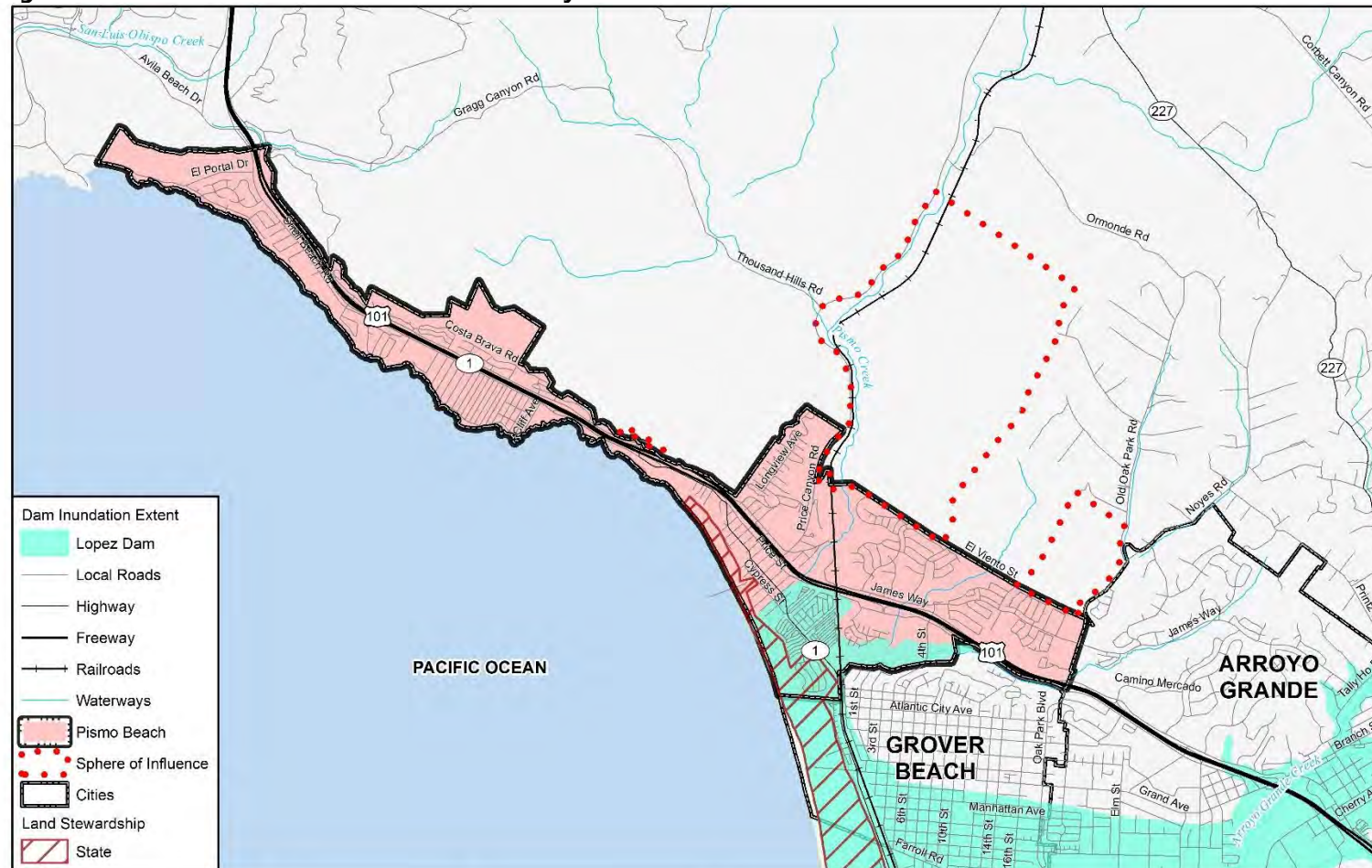
Property Type	Parcel Count	Improved Value	Content Value	Total Value	Loss Estimate	Population
Commercial	5	\$558,082	\$558,082	\$1,116,164	\$558,082	--
Government/Utilities	11	--	--	\$0	\$0	--
Other/Exempt/Misc.	5	\$3,592,647	--	\$3,592,647	\$1,796,324	--
Residential	20	\$5,096,040	\$2,548,020	\$7,644,060	\$3,822,030	50
Multi-Family Residential	20	\$5,912,448	\$2,956,224	\$8,868,672	\$4,434,336	50
Mobile/Manufactured Homes	3	\$17,059,909	\$8,529,955	\$25,589,864	\$12,794,932	8
Residential: Other	2	\$857,194	\$428,597	\$1,285,791	\$642,896	5
TOTAL	66	\$33,076,320	\$15,020,878	\$48,097,198	\$24,048,599	113

Source: San Luis Obispo County Planning and Building Dept., Assessor's Office, ParcelQuest, Wood Plc Parcel Analysis





Figure F.5 Dam Inundation Extents in the City of Pismo Beach



Map compiled 12/2019;
intended for planning purposes only.
Data Source: San Luis Obispo County,
US Census TIGER Database, CA Open
Data Portal, BLM/California State Office,
LAFCO, CA DWR, NID 2018



Drought and Water Shortage

The City of Pismo Beach has a variety of water sources that support the City's water supply, including Lopez Lake, the State Water Project, and groundwater resources. The City owns and operates two wells that pump from the Santa Maria Valley Groundwater Basin, and have a combined pumping capacity of 1,550 gallons per minute.

After multiple years of drought, the City has made efforts to reduce its reliance on groundwater supplies through alternative water opportunities. In 2015 the City announced plans for a water recycling project that will serve the South County area. The Central Coast Blue Project is a regional recycled water project that will treat water from the City's and the South San Luis Obispo County Sanitation District's wastewater treatment plant to produce purified water through a three-step filtration process that will be pumped to injection wells and injected into the Santa Maria Groundwater Basin. This will give an additional drinking water source and help prevent seawater intrusion into the groundwater basin. Construction is expected to begin in 2021 and will be located within the City of Pismo Beach's boundaries.

The following figure from the City of Pismo Beach Urban Water Management Plan (2015) depicts the current and projected water supply through the year 2035. The City is projecting to receive a consistent amount of water supply from wholesale suppliers (Lopez Reservoir and the State Water Project) and increase the City's water supply through the regional recycled water project. Currently, in the event of an emergency the City has emergency connections with the Cities of Arroyo Grande and Grover Beach as well as an opportunity to purchase more allocations from Lopez Lake through the County Flood and Water Conservation District.



**Figure F.6 City of Pismo Beach Current and Projected Water Supplies**

Water Supply Sources		Projected Water Supply (afy)				
Water purchased from:	Wholesale Supplied Volume	2015	2020	2025	2030	2035
Lopez Reservoir	Yes	892	892	892	892	892
State Water Project (Secured) ⁽¹⁾	Yes	1,240	1,240	1,240	1,240	1,240
Supplier-produced groundwater ⁽²⁾	No	700	700	700	700	700
Supplier-produced surface water	No					
Transfers In	No					
Exchanges In	No					
Recycled Water ⁽³⁾	No	0	645	662	680	698
Desalinated Water	No					
Total		2,832	3,477	3,494	3,512	3,530
Notes: 1. The City's allocation includes a 40 af allotment for Pismo 98, LLC and 100 af for the Central Coast Development Company. A portion of this 140 af allotment is available for City use only if there is excess water available from the District. 2. Groundwater supplies include 700 afy allocated as part of the Adjudication of the SMGB. 3. These values are 100% of the anticipated yield from a recycled water upgrade to the Pismo Beach Wastewater Treatment Plant. The City's goal is to develop a regional recycled water project that could share the recycled water with regional partners and potentially utilize additional flows from the South San Luis Obispo County Sanitation District's (SSLOCSD) wastewater treatment plant. If a regional project is implemented, the volume of recycled water available could increase or decrease depending upon interagency agreements and water availability from the SSLOCSD facility among other factors.						

Source: 2015 Urban Water Management Plan for the City of Pismo Beach

Flood

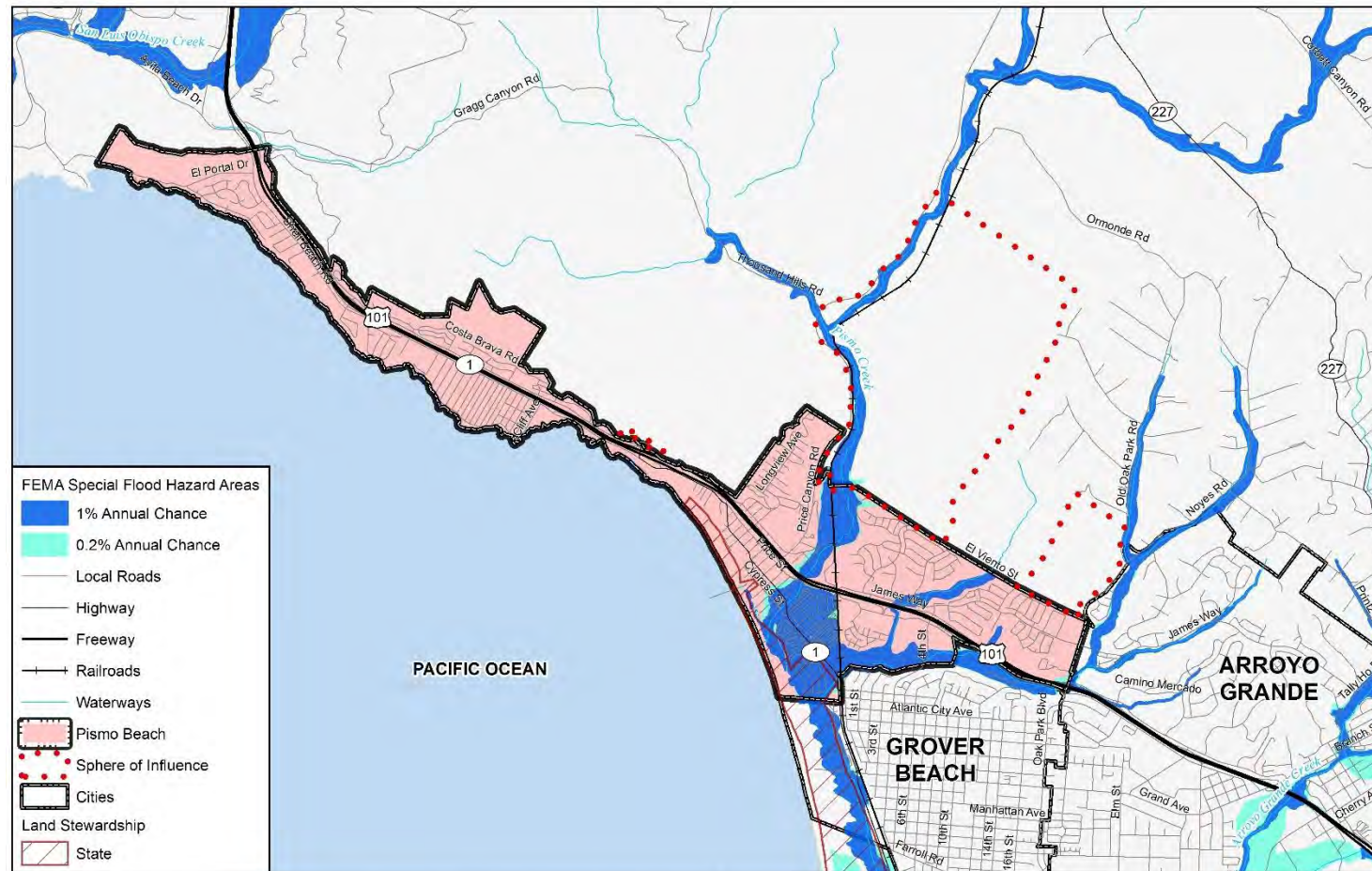
Values at Risk

Following the methodology described in subsection 5.3.11, a flood map for the City of Pismo Beach was created (see Figure F. 7). Table F.12 and Table F.13 summarize the values at risk in the City's 100-year and 500-year floodplain, respectively. These tables also detail loss estimates for each flood. Note that the potential loss increases significantly with the 500-year or 0.2% annual chance flood





Figure F.7 City of Pismo Beach's 100- and 500-Year Floodplains



Map compiled 12/2019;
intended for planning purposes only.
Data Source: San Luis Obispo County,
US Census TIGER Database, CA Open
Data Portal, BLM/California State Office,
LAFCO, FEMA NFHL



Population at Risk

Table F. 12 City of Pismo Beach 1% (100 year) Floodplain Risk

Property Type	Parcel Count	Improved Value	Content Value	Total Value	Loss Estimate	Population
Commercial	5	\$558,082	\$558,082	\$1,116,164	\$279,041	--
Government/Utilities	14	--	--	\$0	\$0	--
Other/Exempt/Misc.	16	\$4,019,686	--	\$4,019,686	\$1,004,922	--
Residential	27	\$6,370,130	\$3,185,065	\$9,555,195	\$2,388,799	68
Multi-Family Residential	45	\$11,083,473	\$5,541,737	\$16,625,210	\$4,156,302	113
Mobile/Manufactured Homes	3	\$17,059,909	\$8,529,955	\$25,589,864	\$6,397,466	8
Residential: Other	2	\$857,194	\$428,597	\$1,285,791	\$321,448	5
TOTAL	112	\$39,948,474	\$18,243,435	\$58,191,909	\$14,547,977	193

Source: San Luis Obispo County Planning and Building Dept., Assessor's Office, ParcelQuest, Wood Plc Parcel Analysis

Table F. 13 City of Pismo Beach 0.2% (500 year) Floodplain Risk

Property Type	Parcel Count	Improved Value	Content Value	Total Value	Loss Estimate	Population
Government/Utilities	1	--	--	\$0	\$0	--
Other/Exempt/Misc.	6	--	--	\$0	\$0	--
Residential	26	\$3,037,516	\$1,518,758	\$4,556,274	\$1,139,069	65
Multi-Family Residential	39	\$8,148,574	\$4,074,287	\$12,222,861	\$3,055,715	98
Residential: Other	10	\$2,659,992	\$1,329,996	\$3,989,988	\$997,497	25
Vacant	1	\$12,489	--	\$12,489	\$3,122	--
TOTAL	83	\$13,858,571	\$6,923,041	\$20,781,612	\$5,195,403	188

Source: San Luis Obispo County Planning and Building Dept., Assessor's Office, ParcelQuest, Wood Plc Parcel Analysis

Insurance Coverage, Claims Paid, and Repetitive Losses

The City of Pismo Beach has been a participant in the National Flood Insurance Program since August 1, 1984, and will continue to participate and remain in compliance with the National Flood Insurance Program (NFIP).

Table F. 14 City of Pismo Beach NFIP Insurance Policy Information

Policies	Insurance in Force	No. of Paid Losses	Total Losses Paid
116	\$37,758,200	7	\$73,623

Source: FEMA National Flood Insurance Program Community Information System

FEMA Community Information System shows that as of April 2019 the City of Pismo does not have any Repetitive Loss (RL) or Severe Repetitive Loss (SRL) properties.

Pismo Beach does not participate in the Community Rating System (CRS).

Critical Facilities at Risk

The City of Pismo Beach has one identified critical facility, a wastewater treatment plan located in the 1% Annual floodplain. None of the City's identified critical facilities are located in the 0.2% Annual (500-year) Floodplain.



Earthquake

There are no mapped active or potentially active faults in the City of Pismo Beach planning area, although the area is exposed to seismic hazards from movement along several regional faults. Historically, the faults that have caused seismic activity in Pismo Beach have originated from movement along the southern segment of the San Andreas Fault, approximately 42 miles northeast of the City. The Wilmar Avenue fault is the only fault that goes through the City of Pismo Beach and is exposed in a sea cliff near the City limits. The Wilmar Avenue Fault is considered potentially active but poses a moderate risk of fault rupture hazard to the Cities of Grover Beach and Arroyo Grande. The largest historical earthquake that impacted the City of Pismo Beach was the Bryson earthquake, a magnitude 6.2 event in November of 1952. The Bryson earthquake caused older, brick masonry buildings to be damaged in the City of Pismo Beach, but no deaths or injuries were reported.

As a coastal community liquefaction, the result of ground shaking causing fine grained, saturate soils to liquefy and as a fluid, also poses a risk to the City of Pismo Beach. Table F.15 shows the types of properties at moderate risk of liquefaction. Based on this analysis there are 66 properties at moderate risk of liquefaction with an improved value of over \$57 million. Government/Utility properties are the most vulnerable property type to liquefaction in Pismo Beach, with a total of 20 properties located in an area of moderate liquefaction risk. Refer to Figure F.8 below for the areas of Pismo Beach vulnerable to liquefaction hazards.

Table F.15 Property Types with Moderate Liquefaction Risk

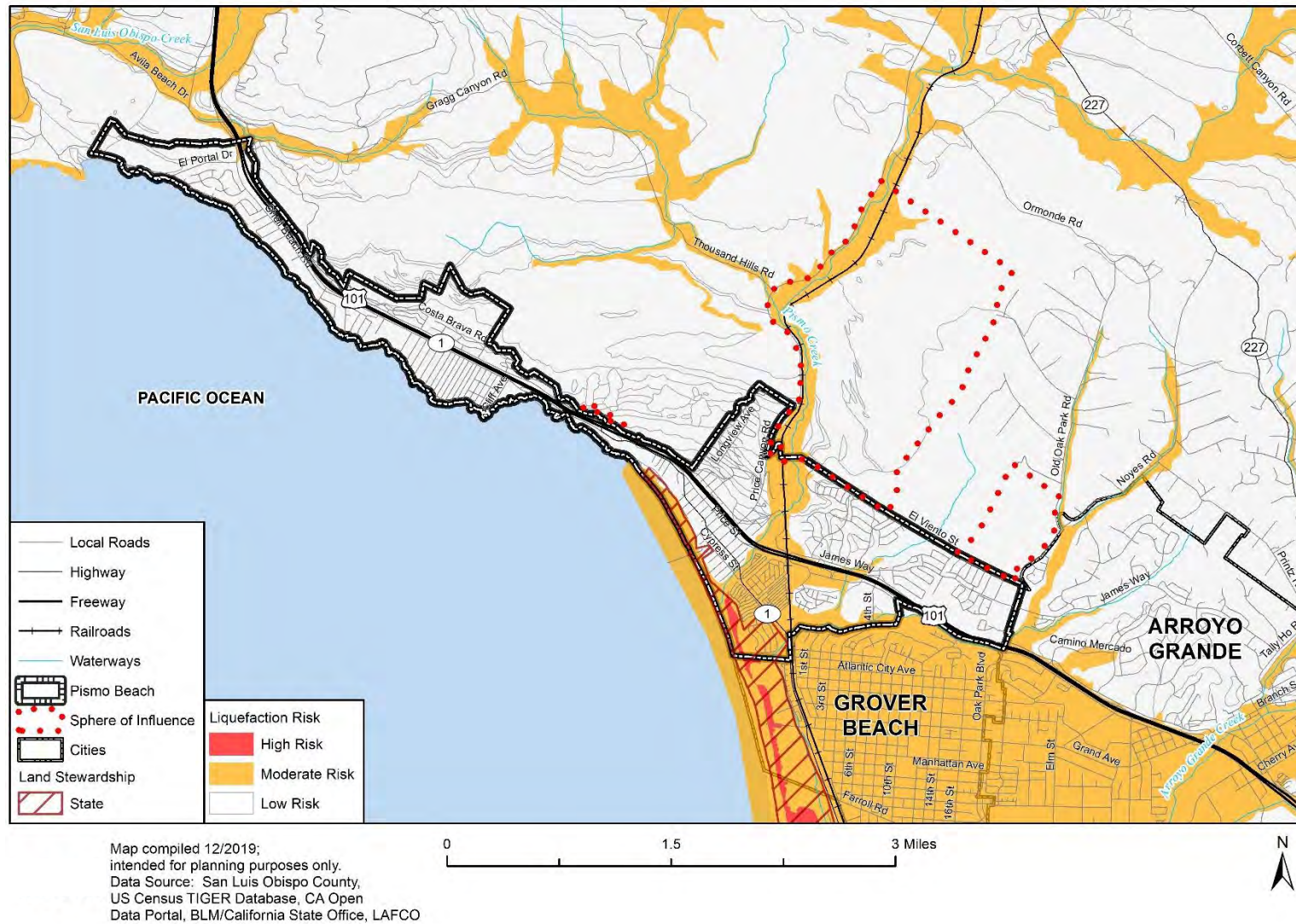
Property Type	Property Count	Improved Value
Commercial	15	\$31,080,392
Government/Utilities	20	--
Other/Exempt/Misc.	6	\$3,885,017
Residential	1	\$2,792
Multi-Family Residential	18	\$1,855,926
Mobile/Manufactured Homes	3	\$17,059,909
Residential: Other	3	\$3,302,992
Total	66	\$57,187,028

Source: San Luis Obispo County Planning and Building Dept., Assessor's Office, ParcelQuest, Wood Plc Parcel Analysis





Figure F.8 City of Pismo Beach Areas Vulnerable to Liquefaction





Landslides

A landslide is a geologic hazard where the force of gravity combines with other factors to cause earth material to move or slide down an incline. Some landslides move slowly and cause damage gradually, whereas others move so rapidly that they can destroy property and take lives suddenly and unexpectedly. The potential for landslides is present on the hill sides to the north of highway 101 and along the Price Canyon corridor. The potential slope instability is greatest on the west facing slopes directly adjacent to the freeway and Price Canyon Road.

The City has had a history of landslide events. County geologists observed earthquake-induced landslides in the foothills after the San Simeon earthquake on December 22, 2003. Minor landsliding was reported along the coastal highway in May 2011 and April 2012. Recent landslide events occurred in 2017 near Spyglass Beach, and in 2018 near Silver Shoals Beach where a 30 by 40-foot section of cliff came down. The Pismo Beach Public Works Department in addition to CAL FIRE assisted in the response to both incidents.

The City of Pismo Beach is among the communities in the County of San Luis Obispo that has the most properties in the Moderate and High landslide potential areas; these properties are located primarily near the hills north of the City (refer to Figure F.9 below). The following tables shows the breakdown of landslide risk by property type.

Table F.16 City of Pismo Beach Properties in the Moderate Landslide Risk Areas

Property Type	Property Count	Improved Value
Commercial	3	\$4,639,233
Government/Utilities	16	--
Other/Exempt/Misc.	41	--
Residential	530	\$178,737,349
Multi-Family Residential	123	\$29,869,616
Residential: Other	22	\$33,812,694
Vacant	5	\$1,263,997
Total	740	\$248,322,889

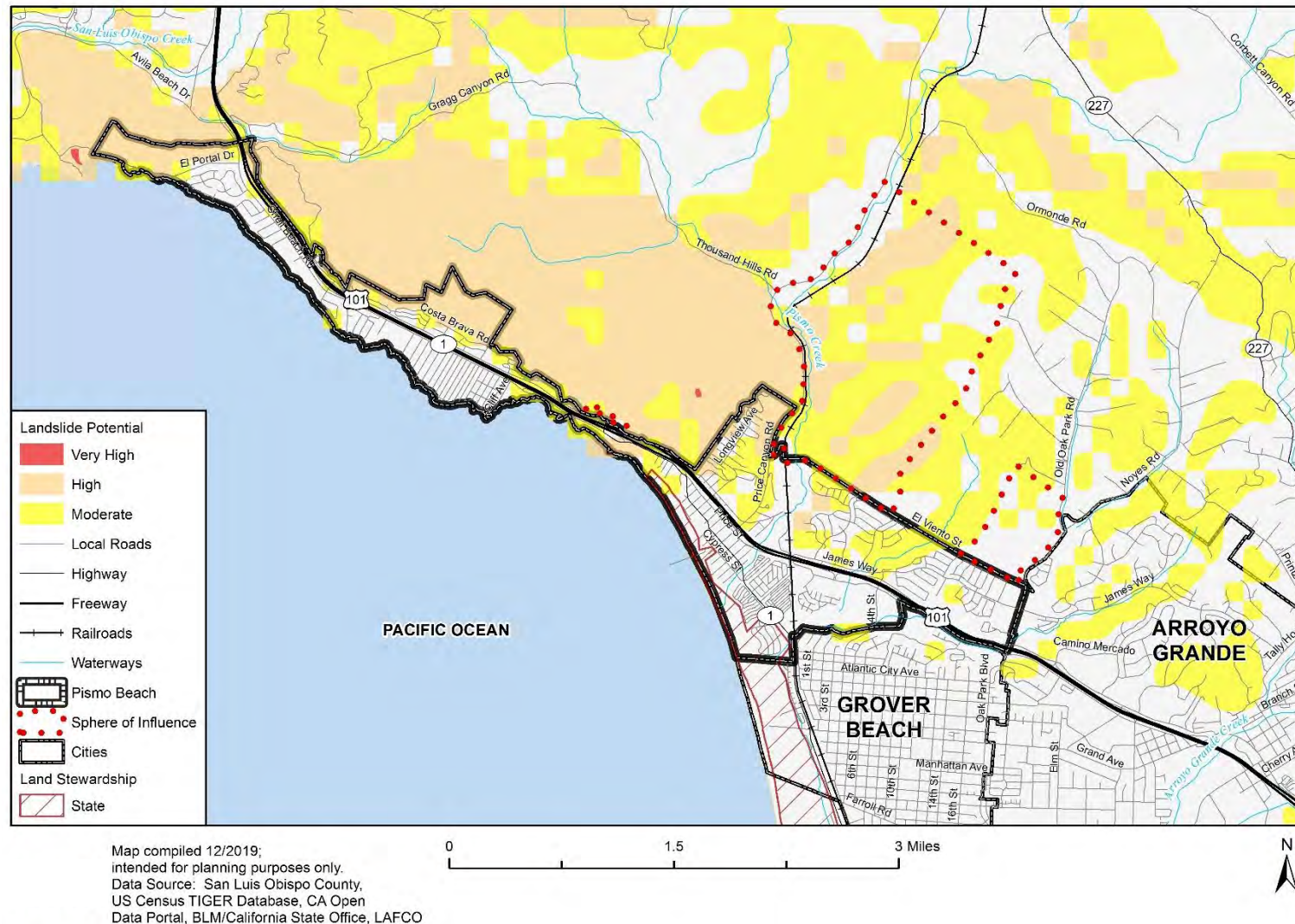
Source: San Luis Obispo County Planning and Building Dept., Assessor's Office, ParcelQuest, Wood Plc Parcel Analysis

Table F.17 City of Pismo Beach Properties in High Landslide Risk Areas

Property Type	Property Count	Improved Value
Government/Utilities	5	--
Other/Exempt/Misc.	12	--
Residential	265	\$107,220,459
Multi-Family Residential	8	\$1,231,141
Residential: Other	8	\$23,736,555
Vacant	5	\$1,508,988
Total	303	\$133,697,143

Source: San Luis Obispo County Planning and Building Dept., Assessor's Office, ParcelQuest, Wood Plc Parcel Analysis

Figure F.9 Areas with Potential Landslide Risk in Pismo Beach





Based on this analysis there are a total of 1,043 properties with a combined improved value of over \$300 million, located in moderate or high landslide risk areas. Residential properties are most at risk of landslides in Pismo Beach. Of the properties located in moderate or high-risk areas, 956 are designated as residential, multi-family residential or residential: other. As shown in the tables below, there are also four critical facilities, all microwave service towers, that are located in moderate to high-risk landslide areas.

Table F.18 Critical Facilities located in Moderate or High Landslide Risk Areas

Critical Facility Type	Count
Moderate Risk	
Microwave Service Tower	2
High Risk	
Microwave Service Tower	2
Grand Total	4

Source: San Luis Obispo County Planning and Building Dept., Assessor's Office, ParcelQuest, Wood Plc Parcel Analysis

The potential for slope instability in the sloping terrain can mostly be mitigated by applying building code requirements that provide minimum requirements for building construction and grading on sloping ground, as these areas are not known to be underlain by large landslide features or notoriously unstable formations. Steep slopes have been a controlling influence in the shaping of the City of Pismo Beach by constraining the location of development. City policies prohibit development on slopes over 30 percent in all areas except Pismo Heights. In addition to this policy, there are several other policies related to landslide risk and mitigation noted in the City's Land Use Element (2014).

Wildfire

Wildfires are a common occurrence in San Luis Obispo County, with some of the most significant wildfire events occurring in the Los Padres National Forest, approximately 22-miles east of the City limits. CAL FIRE has designated the City of Pismo Beach as being at an increased risk from wildfires, and a priority community to work with to prepare and mitigate potential fire risk. According to the County's Community Wildfire Protection Plan (2019), the prevailing wind patterns, especially the Santa Ana Winds which are accompanied by warm temperatures, high wind speeds and low humidities, is another dominant factor that influences the wildfire risk in Pismo Beach. A fire that originates in the Los Osos area or at the Diablo Canyon Power Plant could be pushed by prevailing winds southeast towards the Pismo Beach community.

Analysis using GIS was used to create the following tables to quantify the potential losses by property type of parcels located in the very high wildfire severity zone. Based on the analysis there are 1,068 properties in Pismo Beach that are located within the very high severity zones with a total value of \$501,553,587. Residential property types, including multi-family and residential: other, are the most common property type found in the very high wildfire severity zone. This includes 2,445 persons and 974 residential properties with a combined value of almost \$500 million vulnerable to wildfire events. There is one critical facility, a microwave service tower that is also located in the very high severity wildfire zone.



**Table F.19 City of Pismo Beach Wildfire Risk by Property Type – Very High Severity Zone**

Property Type	Property Count	Improved Value	Content Value	Total Value	Loss Estimate	Population
Commercial	3	\$5,145,662	\$5,145,662	\$10,291,327	\$10,291,327	--
Government/Utilities	12	--	--	\$12	\$12	--
Other/Exempt/Misc.	70	--	--	\$70	\$70	--
Residential	803	\$285,939,224	\$142,969,612	\$428,909,639	\$428,909,639	2,016
Multi-Family Residential	133	\$27,181,799	\$13,590,900	\$40,772,832	\$40,772,832	334
Residential: Other	38	\$12,494,584	\$6,247,292	\$18,741,914	\$18,741,914	95
Vacant	9	\$2,837,784	--	\$2,837,793	\$2,837,793	--
Total	1,068	\$333,599,053	\$167,953,466	\$501,553,587	\$501,553,587	2,445

Source: San Luis Obispo County Planning and Building Dept., Assessor's Office, ParcelQuest, Wood Plc Parcel Analysis

Table F.20 City of Pismo Beach's Critical Facilities in Very High Wildfire Severity Zone

Facility Type	Count
Microwave Service Tower	1
Total	1

Source: San Luis Obispo County Planning and Building Dept., Assessor's Office, ParcelQuest, Wood Plc Parcel Analysis

Acknowledging the City's risk to wildfires, the City's General Plan Safety Element, sets forth policies for wildfire protection, including a requirement for the City to conduct a wildland fire analysis and plan as part of all future annexation, as well as conducting analysis prior to the creation of regional coastal open space areas or parks, as stated in Conservation Element, policy CO-8. Wildfire protection plans are required to specify the following requirements:

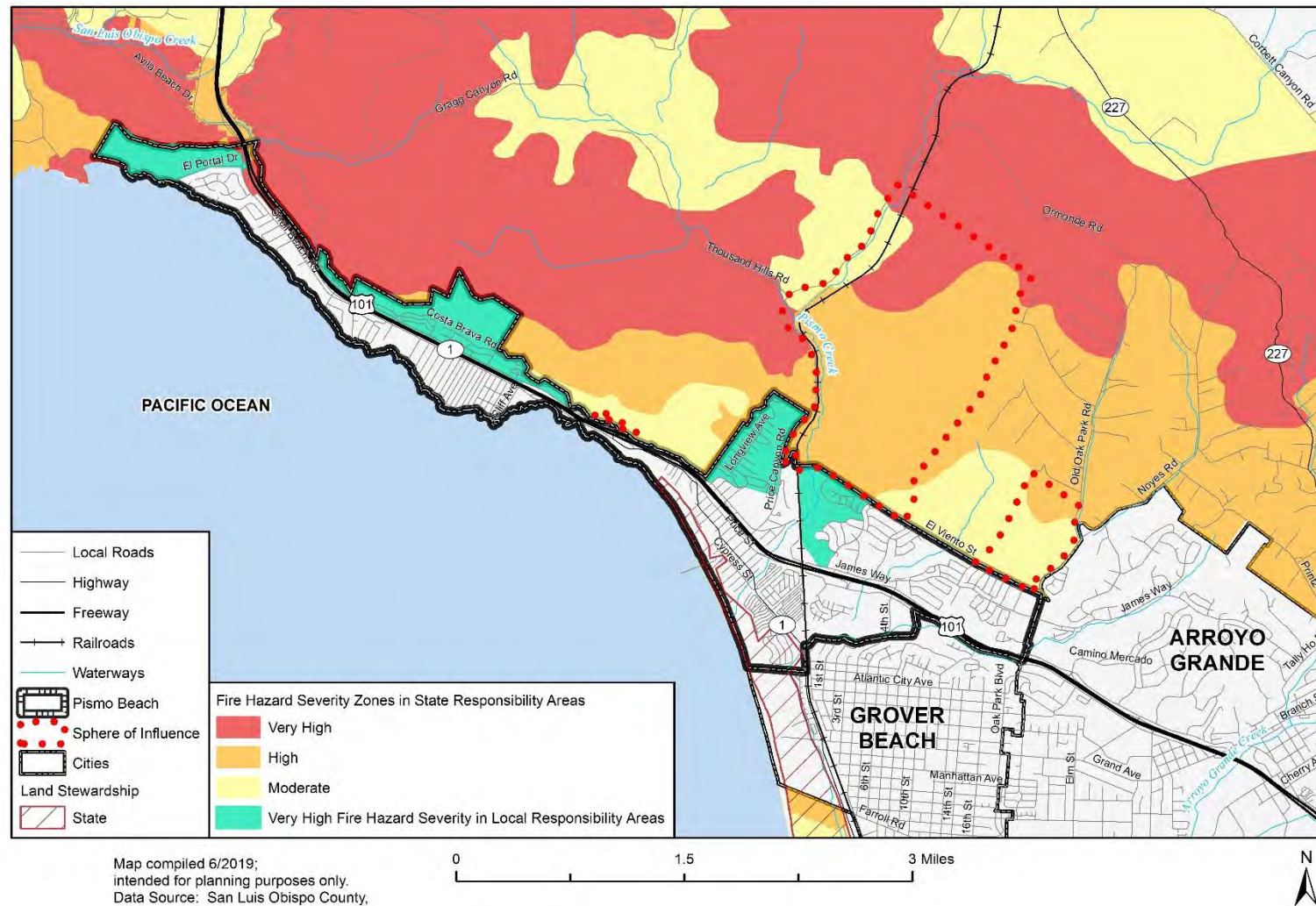
- Appropriate fuel clearance areas
- Building set-backs from undeveloped areas
- Access to high hazard areas
- Standards for evaluation of areas
- Identified turnouts and helispots in road system
- Water supplies
- Manpower and equipment requirements

The following map shows the areas within the very high wildfire severity zones in the City of Pismo Beach.





Figure F.10 City of Pismo Beach Areas of Very High Severity





Tsunami

Tsunami inundation poses a risk to all coastal communities in the County of San Luis Obispo. Offshore faults and related seismic activity could cause a tsunami event off the coast of Pismo Beach, even if the faults are thousands of miles away. The City has had a history of tsunami events. In the last 141 years there have been eight observed tsunami events. Most of these events resulted in little to no wave run-up, except for the event in 1927 which resulted in wave run-ups of 6 feet, over 4 feet wave run-ups in 1960 and under 4 feet in 2010 and 2011. The following table lists the historic tsunami events that have impacted the City of Pismo Beach since 1848.

Table F.21 Historic Tsunami Events, 1878-2011

Date	Origin	Source Type	Run-Up (Feet)
November 22, 1878	Southern California	Probably Submarine Landslide	Observed
November 4, 1927	Southern California	7.3M Earthquake	6
April 1, 1947	Southern California	8.6M Earthquake	Observed
May 22, 1960	South Central Chile	9.5M Earthquake	4.5
March 28, 1964	Prince William Sound, Alaska	9.2M Earthquake	Observed
February 27, 2010	Maule Region, Chile	8.8M Earthquake	3.9
March 11, 2011	Honshu, Japan	9.0M Earthquake	3.3

Source: City of Pismo Beach Local Planning Team, Data Collection Workbook, 2019

Pismo Beach's coastal bluffs (the Pismo Bluffs) in general provide protection from coastal hazards, although the low-lying areas where Pismo Creek meets the ocean are considered to be at moderate risk of tsunami hazards. The following areas were noted in the City's 2015 LHMP as being the highest risk to tsunamis:

- Development located near the mouth of Pismo Creek
- State Parks North Beach Campground
- State Route 1 to the Pacific Ocean from Franklin to Hinds
- US 101 to the Pacific Ocean from Hinds to Price Canyon
- James Way to the Pacific Ocean from Price Canyon to 4th Street

The following table breaks down the tsunami risk for the City of Pismo Beach by property type.



**Table F.22 City of Pismo Beach's Tsunami Risk by Property Type**

Property Type	Parcel Count	Improved Value	Content Value	Total Value	Population
Commercial	18	\$10,188,285	\$10,188,285	\$20,376,570	--
Government/Utilities	30	--	--	\$0	--
Other/Exempt/Misc.	29	\$3,783,908	--	\$3,783,908	--
Residential	98	\$28,903,496	\$14,451,748	\$43,355,244	246
Multi-Family Residential	219	\$43,209,500	\$21,604,750	\$64,814,250	550
Mobile/Manufactured Homes	3	\$17,059,909	\$8,529,955	\$25,589,864	8
Residential: Other	29	\$22,662,259	\$11,331,130	\$33,993,389	73
Vacant	1	\$9,000,000	--	\$9,000,000	--
Total	427	\$134,807,357	\$66,105,867	\$200,913,224	877

Source: Wood Plc analysis based on ParcelQuest and San Luis Obispo County Assessor's Office data 2019

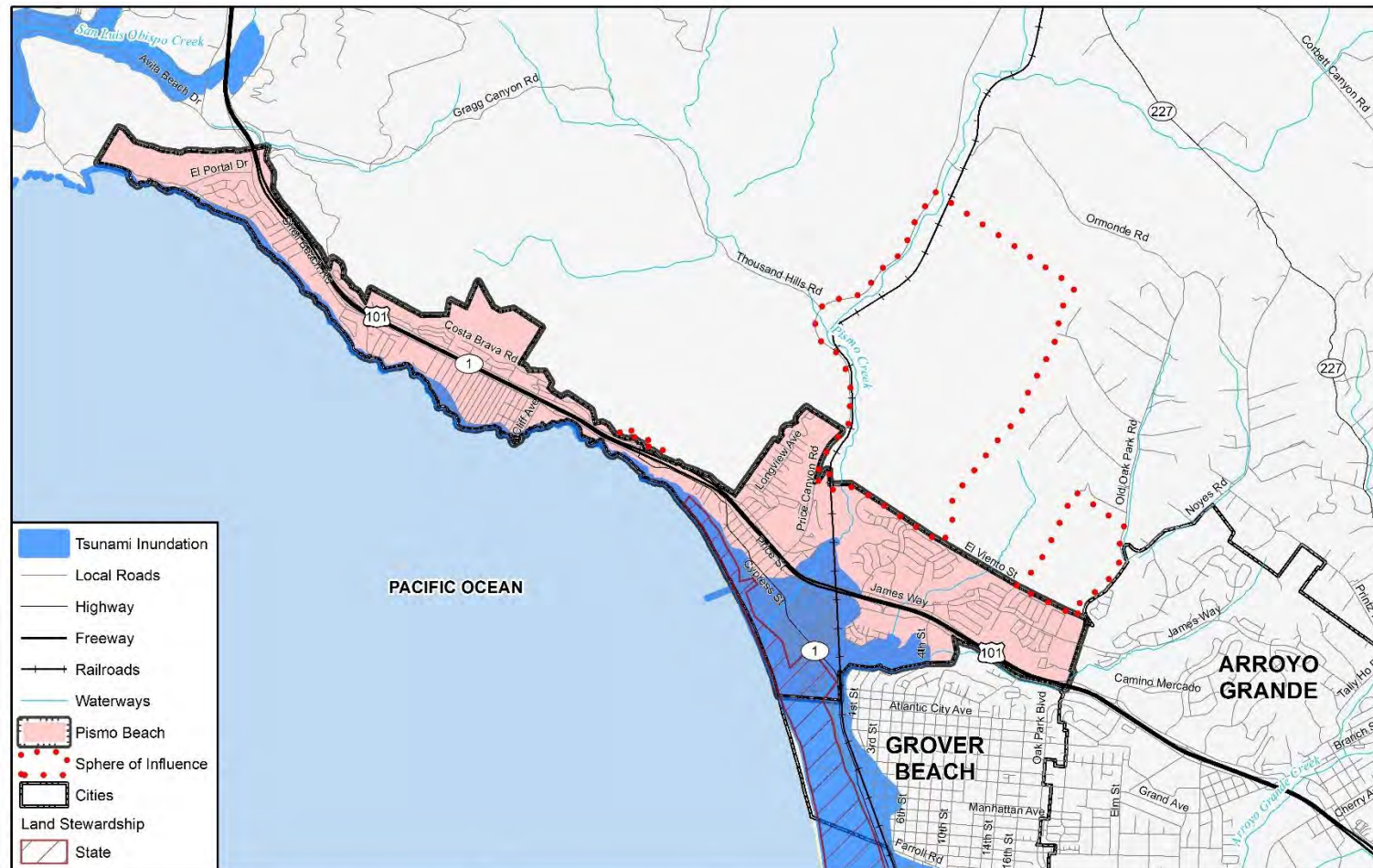
Based on this analysis all of the City of Pismo Beach coastline is at significant risk to a tsunami event, particularly the southern portion of the City limits. There are 427 properties with a combined value of over \$200 million vulnerable to the impacts of a tsunami. Of the properties at risk, 349 are residential properties (includes mobile/manufactured homes), with a majority being multi-family residential and have a combined loss estimate of over \$167 million. There is a population of 877 at risk of tsunami events, although the LPT noted this number will increase drastically in the summer months when the City and the surrounding attractions are filled with tourists who may not be familiar with the risk tsunamis pose leading them to not heed warnings. Refer to Section 5 of the Base Plan for additional information related to the past tsunami events and analysis on future vulnerability.

The following map show the areas at risk of potential inundation from a tsunami event.





Figure F.11 City of Pismo Beach Areas of Tsunami Inundation



Map compiled 12/2019;
intended for planning purposes only.
Data Source: San Luis Obispo County,
US Census TIGER Database, CA Open
Data Portal, BLM/California State Office,
LAFCO, CA Dept. of Conservation



Human Caused: Hazardous Materials

The Cal OES Warning Center reports 54 hazardous materials incidents in the City of Pismo Beach from 1994 through October 24, 2018; as noted in subsection 5.3.16 of the county plan, this likely excludes a large number of unreported minor spills. This constitutes 3% of the hazardous materials incidents reported county-wide during the same time frame and averages out to roughly 2.2 incidents per year. As noted in subsection 5.3.16, only around 6% of reported hazardous materials incidents result in injuries, fatalities, or evacuations.

There are no significant hazardous materials facilities located in the City. However, Pismo Beach sits within the Emergency Planning Zone for the Diablo Canyon Nuclear Power Plant.

F.4 Capability Assessment

Capabilities are the programs and policies currently in use to reduce hazard impacts, or that could be used to implement hazard mitigation activities. This capability assessment is divided into five sections: regulatory mitigation capabilities, administrative and technical mitigation capabilities, fiscal mitigation capabilities, mitigation outreach and partnerships, and other mitigation efforts.

To develop this capability assessment, the jurisdictional planning representatives used a matrix of common mitigation activities to inventory which of these policies or programs were in place. The team then supplemented this inventory by reviewing additional existing policies, regulations, plans, and programs to determine if they contributed to reducing hazard-related losses.

During the plan update process, this inventory was reviewed by the jurisdictional planning representatives and Wood consultant team staff to update information where applicable and note ways in which these capabilities have improved or expanded. Additionally, in summarizing current capabilities and identifying gaps, the jurisdictional planning representatives also considered their ability to expand or improve upon existing policies and programs as potential new mitigation strategies. The City of Pismo Beach's capabilities are summarized below.





F.4.1 Regulatory Mitigation Capabilities

Table F.23 City of Pismo Beach Regulatory Mitigation Capabilities

Regulatory Tool	Yes/No	Comments
General plan	Yes	
Zoning ordinance	Yes	
Subdivision ordinance	Yes	
Growth management ordinance	No	
Floodplain ordinance	Yes	
Other special purpose ordinance (stormwater, water conservation, wildfire)	Yes	Stormwater Ordinance
Building code	Yes	
Fire department ISO rating	Yes	
Erosion or sediment control program	Yes	
Stormwater management program	Yes	
Site plan review requirements		
Capital improvements plan	Yes	
Economic development plan	No	
Local emergency operations plan	Yes	
Other special plans		
Flood Insurance Study or other engineering study for streams	Yes	
Elevation certificates (for floodplain development)	Yes	

F.4.2 Administrative/Technical Mitigation Capabilities

Table F.24 identifies the personnel responsible for activities related to mitigation and loss prevention in Pismo Beach



**Table F.24 City of Pismo Beach Administrative/Technical Mitigation Capabilities**

Personnel Resources	Yes/No	Department/Position
Planner/engineer with knowledge of land development/land management practices	Yes	Community Development – Associate Planners
Engineer/professional trained in construction practices related to buildings and/or infrastructure	Yes	Public Works – City Engineer
Planner/engineer/scientist with an understanding of natural hazards	Yes	Community Development – Associate Planners and Public Works – City Engineer
Personnel skilled in GIS	Yes	Public Works – City Engineer
Full time building official	Yes	Community Development
Floodplain manager	Yes	Community Development – Director
Emergency manager	Yes	City Manager
Grant writer	No	TBD
Other personnel	Unknown	Unknown
GIS Data Resources (Hazard areas, critical facilities, land use, building footprints, etc.)	Yes	Public Works- City Engineer
Warning systems/services (Reverse 9-11, outdoor warning signals)	Yes	Police and Fire

F.4.3 Fiscal Mitigation Capabilities

Table F.25 identifies financial tools or resources that the City could potentially use to help fund mitigation activities.

Table F.25 City of Pismo Beach Fiscal Mitigation Capabilities

Financial Resources	Accessible/Eligible to Use (Yes/No)
Community Development Block Grants	Yes
Capital improvements project funding	Yes
Authority to levy taxes for specific purposes	Yes
Fees for water, sewer, gas, or electric services	Yes
Impact fees for new development	Yes
Incur debt through general obligation bonds	Yes – with voter approval
Incur debt through special tax bonds	Yes
Incur debt through private activities	Yes
Withhold spending in hazard prone areas	No

F.4.4 Mitigation Outreach and Partnerships

The City of Pismo Beach Public Works Department conducts several water programs related to water usage and water conservation. Their website provides information for residents related to water wise gardening and links to “how to garden in a drought.” The Department also has a stormwater program which includes public outreach related to water pollution and how to improve discharges from individual residences within the City of Pismo Beach. The City of Pismo Beach website has a “Community Emergency & Disaster Preparedness” page which





contains resources and information for individuals, families, and businesses on how to prepare for an emergency. The Preparedness web page also contains information specific to individuals with various disabilities including mobility, vision, hearing, and special medical needs.

F.4.5 Other Mitigation Efforts

The City has designated 550 Frady Lane as the Pismo Beach Sandbag Station location, and provides bags and shovels at the site. The Planning Team also shared the following mitigation projects as past or ongoing projects:

- Worked on Five Cities Drive Lift station floodproofing to reduce impacts to the critical facility.
- Ongoing work with FEMA related to FIRM maps for the City.
- Working on Bello Street Bridge plans within construction starting soon. Will reduce the impacts for flooding and emergency evacuation routes.
- Vegetation reeducation and weed abatement programs for fuel reeducation are ongoing.
- Public Works has been coordinating with County OES regarding consistent signage with the County. Signs are being manufactured but have not been installed yet.

F.4.6 Opportunities for Enhancement

Based on the capability assessment, the City of Pismo Beach has several existing mechanisms in place that already help to mitigate hazards. In addition to these existing capabilities, there are also opportunities for the City to expand or improve on these policies and programs to further protect the community. Future improvements may include providing training for staff members related to hazards or hazard mitigation grant funding in partnership with the County and Cal OES. Additional training opportunities will help to inform City staff members on how best to integrate hazard information and mitigation projects into their departments. Continuing to train City staff on mitigation and the hazards that pose a risk to the City of Pismo Beach will lead to more informed staff members who can better communicate this information to the public. The City also has the opportunity to become a StormReady and a TsunamiReady community which can provide training resources for City staff as well as public outreach and educational opportunities.

F.5 Mitigation Strategy

F.5.1 Mitigation Goals and Objectives

During the 2019 Planning Process the Pismo Beach Planning Team reviewed the mitigation goals and objectives from the 2014 LHMP and determined the existing number and intent of the goals and objectives continue to be appropriate and no revisions or additions were necessary. The City of Pismo Beach's 2019 hazard mitigation goals are the following:

Goal 1 – Promote disaster-resistant development

Goal 2 – Build and support local capacity to enable the public to prepare for, respond to and recover from disasters

Goal 3 – Reduce the possibility of damage and losses due to bluff/erosion failure

Goal 4 – Reduce the possibility of damage and losses due to coastal storm

Goal 5 – Reduce the possibility of damage and losses due to dam failure





Goal 6 – Reduce the possibility of damage and losses due to earthquake

Goal 7 – Reduce the possibility of damage and losses due to flood

Goal 8 – Reduce the possibility of damage and losses due to hazardous material events

Goal 9 – Reduce the possibility of damage and losses due to landslide

Goal 10 – Reduce the possibility of damage and losses due to tsunami

Goal 11 – Reduce the possibility of damage and losses due to wildland fire

Continued Compliance with the National Flood Insurance Program

The City has been an NFIP participating community since 1984. In addition to the mitigation actions identified herein the City will continue to comply with the NFIP. This includes ongoing activities such as enforcing local floodplain development regulations, including issuing permits for appropriate development in Special Flood Hazard Areas, and ensuring that this development mitigated in accordance with the regulations. This will also include periodic reviews of the floodplain ordinance to ensure that it is clear and up to date and reflects new or revised flood hazard mapping. The City of Pismo Beach does not currently have any Repetitive Loss or Severe Repetitive Loss properties.

F.5.2 Completed and Deleted 2015 Mitigation Actions

The City of Pismo Beach has completed one mitigation action identified in the 2015 plan. This completed actions has reduced vulnerability to hazards and increased local capability to implement additional mitigation actions. The completed action is as follows:

Action 9. Acquire, relocate, elevate, and/or floodproof critical facilities that are located within eh 100-year floodplain

The City of Pismo Beach has reduced the impacts of the Five Cities Drive Lift Station, a critical facility for the community through floodproofing mechanisms.

After reviewing the 2015 mitigation actions, the Planning Team determined that the following action could be deleted:

Action 12. Increase participation in the National Flood Insurance Program (NFIP) by entering the Community Rating System program which through enhanced floodplain management activities would allow property owners to receive a discount on their flood insurance.

It was determined that this action was not feasible due to the minimum rating needed to qualify for the Community Rating System program.

F.5.3 Mitigation Actions

The Planning Team for the City of Pismo Beach identified and prioritized the following mitigation actions based on the risk assessment. Actions were prioritized using the process described in subsection 7.2.1 of the Base Plan. Background information and information on how each action will be implemented and administered, such as ideas for implementation, responsible office, potential funding, estimated cost, and timeline are also included.




Table F.26 City of Pismo Beach 2020 Mitigation Action Plan

ID	Hazard(s) Mitigated	Description/Background/Benefits	Lead Agency and Partners	Cost Estimate	Potential Funding	Priority	Timeline	Status/ Implementation Notes
PB.1	Flood; Coastal Storm, Sea Level Rise Dam Incidents, Tsunami	Rehabilitate Bello Bridge to withstand flooding and tsunami hazards.	Public Works	Over \$1,000,000	FEMA HMA	High	3-5 yrs.	In progress. Working on Bello Street Bridge plans. About to start construction. Reduces impacts for flooding and emergency evacuation routes
PB.2	Flood	Work with FEMA Region IX to address any floodplain management issues that may have arisen/arise from the countywide Digital Flood Insurance Rate Map (DFIRM), Community Assessment Visits, and/or the Department of Water Resources (DWR).	Community Development, Public Works	Less than \$10,000	Staff Time/Dept. Budget	High	Ongoing	In progress. Ongoing work with FEMA re FIRM maps
PB.3	Tsunami	Display standardized and easy to read signs alerting community members of tsunami hazard zones, evacuation routes, and evacuation sites.	Public Works, Police, Fire	Little to no cost	FEMA HMA	High	1 yr.	In progress. Tsunami signage. Public Works has been coordinating with SLO County OES regarding consistent signage with the County. About to get signage manufactured. Not yet installed.
PB.4	Dam Failure	Develop a public outreach program that informs property owners located in the dam or levee inundation areas about voluntary flood insurance.	Fire, Community Development, Public Works	Little to no cost	Staff Time/Dept. Budget	High	2-3 yrs.	Deferred





ID	Hazard(s) Mitigated	Description/Background/Benefits	Lead Agency and Partners	Cost Estimate	Potential Funding	Priority	Timeline	Status/ Implementation Notes
PB.5	Earthquake	Develop an "Earthquake Education Program" for residents which illustrates what steps the individual can take to prepare for an earthquake and mitigate the effects of an earthquake. Coordinate with Community Emergency Response Teams (CERT) where applicable.	Community Development	Little to no cost	Staff Time/Dept. Budget	High	1 yr.	Deferred. Due to Department workload and funding.
PB.6	Earthquake	Target old pipelines in seismic areas for upgrades and automatic seismic shut-off switches that cut off natural gas to customers	Community Development, Public Works	\$500,000 to \$1,000,000	FEMA HMA	High	More than 5 yrs.	In progress. Portions of gas pipelines being replaced. Switches?
PB.7	Hazardous Materials	Conduct a public awareness and educational campaign to raise awareness about the presence of hazardous materials throughout the City.	Fire, Police	Little to no cost	Community Action Renewed Environment (CARE) and PDM	High	1 yr.	Deferred. Still needed if there is a hazmat impact to City
PB.8	Landslide	Stabilize landslide-prone areas through stability improvement measures, including interceptor drains, in situ soil piles, drained earth buttresses, and subdrains.	Community Development, Public Works	\$500,000 to \$1,000,000	FEMA HMA	High	More than 5 yrs.	Deferred. Additional study needed before requiring.
PB.9	Wildfire	Create a vegetation management program that provides vegetation management services to elderly, disabled, or low-income property owners who lack the resources to remove flammable vegetation from around their homes.	Fire	Little to no cost	FEMA HMA	High	2-3 yrs.	Deferred. Need additional CAL FIRE approval for such a program.
PB.10	Wildfire	Implement a fuel modification program, which also includes residential maintenance requirements and enforcement, plan submittal and approval process, guidelines for planting, and a listing of undesirable plant species. Require builders and developers to submit their plans, complete with proposed fuel modification zones, to the local fire department for	Fire	Little to no cost	FEMA HMA	High	Annual	In progress. Vegetation reduction and weed abatement programs for fire fuel reduction have been ongoing





ID	Hazard(s) Mitigated	Description/Background/Benefits	Lead Agency and Partners	Cost Estimate	Potential Funding	Priority	Timeline	Status/ Implementation Notes
		review and approval prior to beginning construction.						
PB.11	Wildfire	Develop and provide funding and/or incentives for defensible space measures (e.g., free chipping day, free collection day for tree limbs).	Fire	Little to no cost	FEMA HMA	High	2-3 yrs.	Deferred. Could be useful but still needs implementation.
PB.12	Wildfire	Provide assistance to private property owners for brush and weed abatement	All cities, county, CalFire	Little to no cost	State grants; Federal grants	High	Annual	New
PB.13	Wildfire	Implement a fuel modification program, which also includes residential maintenance requirements and enforcement, plan submittal and approval process, guidelines for planting, and a listing of undesirable plant species. Require builders and developers to submit their plans, complete with proposed fuel modification zones, to the local fire department for review and approval prior to beginning construction.	Fire	Less than \$10,000	FEMA HMA	High	2-3 yrs.	In progress. Vegetation reduction and weed abatement programs for fire fuel reduction have been ongoing
PB.14	Drought	Develop additional water efficient landscape measures for new construction, including the encouragement xerophytic landscape designs.	Community Development Department	Little to no cost	TBD	Low	2-3 yrs.	New
PB.15	Drought	Continue to monitor reservoir and well water levels. Develop and enact a tiered water restriction program in the event of drought conditions or other water availability emergency, including possible limits on new construction.	Community Development Department	Little to no cost	TBD	High	2-3 yrs.	New





F.6 Implementation and Maintenance

Moving forward, the City will use the mitigation action table in the previous section to track progress on implementation of each project. Much progress has been made since the plan was originally developed. Implementation of the plan overall is discussed in Section 8 in the Base Plan.

F.6.1 Incorporation into Existing Planning Mechanisms

The information contained within this plan, including results from the Vulnerability Assessment, and the Mitigation Strategy will be used by the City to help inform updates and the development of local plans, programs and policies. City staff may utilize the hazard information when implementing preparing and implementing the City's Ten-Year Capital Improvement Program. Within the City's Community Development Department, the Planning and Building Divisions may utilize the hazard information when reviewing a site plan or other type of development applications. The City will also incorporate this LHMP into the Safety Element of their General Plan, as recommended by Assembly Bill (AB) 2140.

As noted in Section 8 Plan Implementation and Monitoring, the HMPC representatives from Pismo Beach will report on efforts to integrate the hazard mitigation plan into local plans, programs and policies and will report on these efforts at the annual HMPC plan review meeting.

F.6.2 Monitoring, Evaluation and Updating the Plan

The City will follow the procedures to monitor, review, and update this plan in accordance with San Luis Obispo County as outlined in Section 8 of the Base Plan. The City will continue to involve the public in mitigation, as described in subsection 8.3 of the Base Plan. The City's Community Development Director will be responsible for representing the City in the County HMPC, and for coordination with City staff and departments during plan updates. The City realizes it is important to review the plan regularly and update it every five years in accordance with the Disaster Mitigation Act Requirements as well as other State of California requirements.





G.1 Community Profile

G.1.1 Mitigation Planning History and 2019 Process

Annex G, City of San Luis Obispo (City), was created during the development of the 2019 Multi-Jurisdictional San Luis Obispo Hazard Mitigation Plan update (HMP). This Jurisdictional Annex builds upon and supersedes the 2014 City of San Luis Obispo Local Hazard Mitigation Plan (LHMP). The 2014 Plan was not integrated into the City's Land Use Element; that integration will be done after the approval of this updated Plan. The General Plan Safety Element references the 2014 Local Hazard Mitigation Plan in Chapter 5:

- Additional information on hazards in the San Luis Obispo area can be found in the Technical Background Report for the San Luis Obispo County and Cities Safety Element (June 1999). Additionally, the City of San Luis Obispo Local Hazard Mitigation Plan presents a comprehensive risk assessment of natural hazards that have the potential to affect the City of San Luis Obispo. The Local Hazard Mitigation Plan was developed by the City in accordance with the Federal Disaster Mitigation Act of 2000, adopted by the City Council and approved by the Federal Emergency Management Agency. The Local Hazard Mitigation Plan suggests possible mitigation actions for reducing the effects of potential hazards. It is incorporated by reference into the Safety Element and should be consulted when addressing known hazards to ensure the general health and safety of people within the City of San Luis Obispo. The goals and policies within this Safety Element support and are consistent with the recommended mitigation strategy within the Local Hazard Mitigation Plan.

The City had representation on the County multi-jurisdictional Hazard Mitigation Planning Committee and utilized a Local Planning Team (LPT) subcommittee to develop input into the annex.

Table G.1 City of San Luis Obispo Local Planning Team

Department or Stakeholder	Title
Fire Department	Fire Chief
Fire Department	Fire Marshall
Fire Department	Administrative Analyst
Administration	Natural Resources Manager
Administration	Sustainability Manager

More details on the planning process and participating jurisdictions, service districts and stakeholders can be found in Section 3 of the Base Plan, along with the public's role during the 2019 update.

G.1.2 Geography and Climate

The City is located in California's Central Coast region approximately 200 miles north of Los Angeles and 230 miles south of San Francisco. The City is situated to the west of the Santa Lucia Mountains and is located eight miles east of the Pacific Ocean. The San Luis Obispo Creek originates from the mountains and flows westward in confluence with the Pacific Ocean at Avila Beach. The mountain ranges form a natural barrier to development in San Luis Obispo. The City is an estimated 10.7 square miles and is surrounded by protected open space and productive agricultural lands. San Luis Obispo is regionally accessible via US Highway 1, US Highway 101, and State Route 227 (Broad Street). The City terrain stands at an average elevation of 300 feet above sea level, with prominent peaks such as Cerro San Luis and Bishop Peak at 1,292 and 1,559 feet, respectively, above sea level.



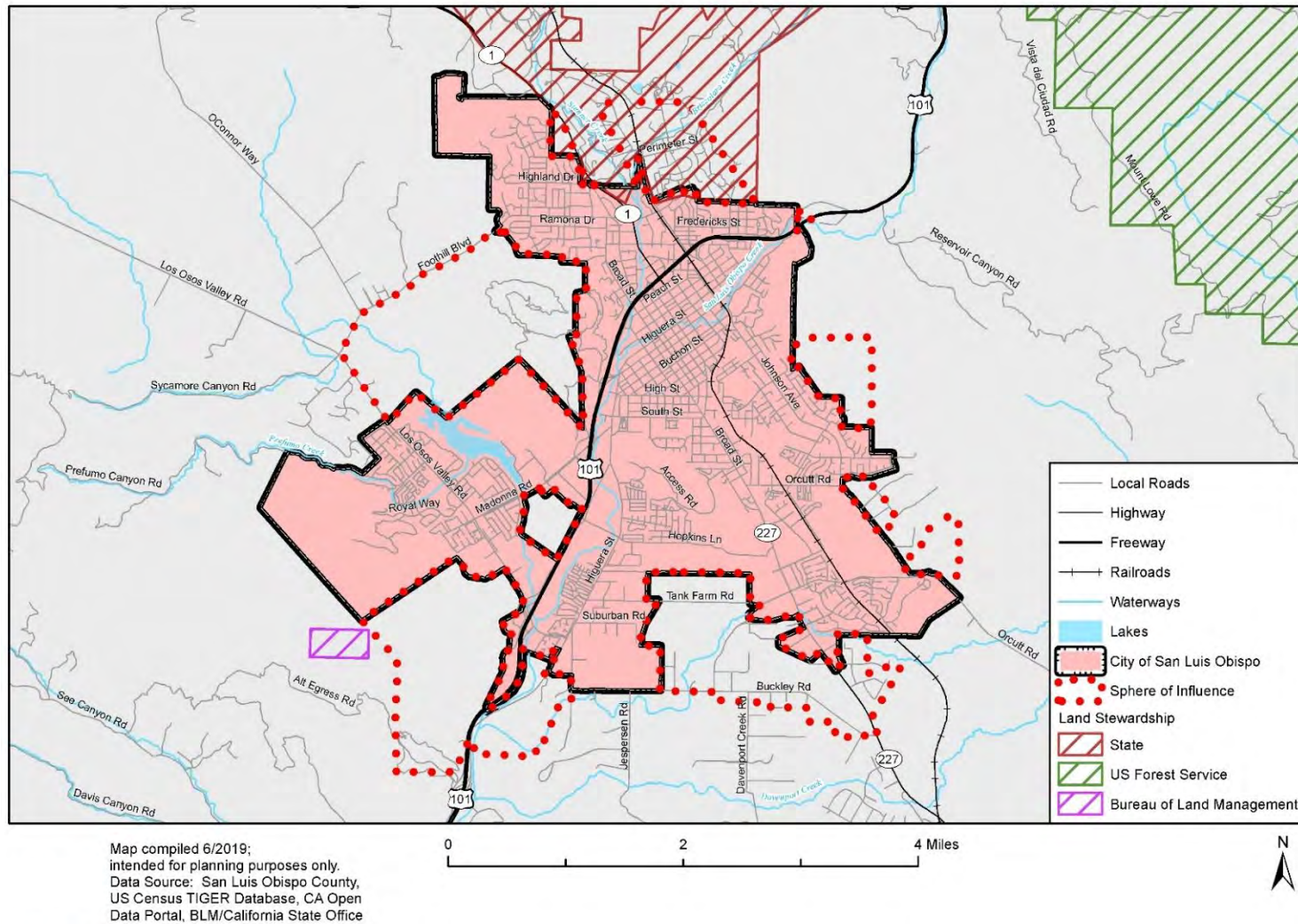


The City's Sphere of Influence includes approximately 5,930+/- acres outside of the City limits and includes nine unincorporated areas: Cal Poly, Florita-Alrita, Orcutt, Broad Street, Airport, Chevron, Los Osos Valley Road/US Highway 101, San Luis Ranch, and Cerro San Luis area. All lands outside of the City's Sphere of Influence are regulated by the San Luis Obispo County General Plan and zoning designations. State law requires that cities maintain plans for areas outside of their immediate jurisdiction if the areas have a direct relationship to planning needs.





Figure G.1 The City of San Luis Obispo





San Luis Obispo is characterized by a Mediterranean climate with an average temperature of 70.2 degrees Fahrenheit. While generally considered a mild climate, weather patterns and events have historically observed both unseasonably warm periods and cold spells. The City receives an average precipitation of 19 inches per year, with increased amounts of rainfall in the winter and spring months between November and April (US Climate Data 2019). Due to its close proximity to the Pacific Ocean, San Luis Obispo is also subject to coastal weather influences such as dense fog that typically rolls into the City through the Chorro Valley, steady on-shore wind patterns, and coastal storms. For general details on climate characteristics of the region refer to the Adverse Weather Section of the Risk Assessment in the HMP (subsection 5.3.1).

G.1.3 History

The native Chumash Tribe was the first known settled human population in the City of San Luis Obispo area. The Chumash established a network of villages along the San Luis Obispo Creek. Spanish Colonization of the area began in 1769 with the founding of Mission San Luis Obispo de Tolosa in 1772 by Father Junipero Serra, resulting in devastating impacts to the Chumash culture. Diseases and significant alterations of culture due to the establishment of the mission caused a significant decrease in the Native American population. Spanish and Mexican ranchos were established in the area in the late 1700s. The development of the area of San Luis Obispo has historically been connected to the San Luis Obispo Creek, where the first settlements could be found, and to the emphasis on agricultural production by the Mission and later the adjacent ranchos.

The California Land Act of 1851 caused a shift to residential development in San Luis Obispo. By 1870, the community had grown to a population of 1,579 and it became a charter city in 1876. Historic influences on the growth and development of San Luis Obispo include the City's beginnings as a center for agricultural productivity, the extension of the Southern Pacific Railroad in 1894, and the establishment of California Polytechnic State University (Cal Poly) in 1901.

Agriculture, transportation, government, and education related activities continue to play a significant role in the demographic, economic, land use, and development characteristics of the City. These characteristics and proactive protection of the City's natural and scenic resources contribute to the small-town charm and high quality of life of the City's residents.

G.1.4 Economy

As the civic, economic, and cultural hub of the Central Coast, the City serves as the seat of the County of San Luis Obispo. With major regional employers such as Cal Poly, state agencies, PG&E, Tenet Health Care, and the County of San Luis Obispo, the City has an estimated daytime population of more than 70,000 people. The San Luis Obispo Chamber of Commerce and the Downtown Association are active collaborators and leaders in supporting the retention and expansion of local businesses in the City. The City's leading industries include hospitality, food services, retail, professional services, health care, information and technology, public administration, and educational sectors.

To support the high quality of life and economic vitality of the community, San Luis Obispo is considered a full-service city, providing police, fire, water, sewer, streets, transit, parking, planning, building, engineering, and parks and recreation services to the community.

Select estimates of economic characteristics for the City of San Luis Obispo are shown in Table G.2.



**Table G.2 City of San Luis Obispo Economic Characteristics, 2017**

Characteristic	City of San Luis Obispo
Families below Poverty Level	6.9%
All People below Poverty Level	32.4%
Median Family Income	\$87,635
Median Household Income	\$49,640
Per Capita Income	\$29,748
Population in Labor Force	25,363
Population Employed*	41,668
Unemployment	1,128

Source: U.S. Census Bureau American Community Survey 2017, www.census.gov/

*Excludes armed forces

Table G.3 and Table G.4 show the occupational and industry breakdown of the City of San Luis Obispo's labor force based on estimates from the 2017 American Community Survey.

Table G.3 City of San Luis Obispo's Employment by Occupation, 2017

Occupation	# Employed	% Employed
Sales and Office Occupations	5,630	21.6%
Management, Business, Science, and Arts Occupations	10,777	44.5%
Natural Resources, Construction, and Maintenance Occupations	934	3.9%
Production, Transportation, and Material Moving Occupations	1,632	6.7%
Service Occupations	5,240	21.6%
Total	24,213	

Source: U.S. Census Bureau American Community Survey 2017, www.census.gov/

*Excludes armed forces

Table G.4 City of San Luis Obispo's Employment by Industry, 2017

Industry	# Employed	% Employed
Retail Trade	3,044	12.6%
Professional, Scientific, and Mgmt., and Administrative and Waste Mgmt. Services	2,879	11.9%
Manufacturing	1,585	6.5%
Arts, Entertainment, and Recreation, and Accommodation, and Food Services	4,292	17.7%
Construction	886	3.7%
Finance and Insurance, and Real Estate and Rental and Leasing	846	3.5%
Public Administration	948	3.9%
Other Services, Except Public Administration	1,281	5.3%
Wholesale Trade	509	2.1%
Transportation and Warehousing, and Utilities	731	3.0%
Agriculture, Forestry, Fishing and Hunting, and Mining	269	1.1%
Information	457	1.9%
Educational Services, and Health Care, and Social Assistance	6,486	26.8%
Total	24,213	

Source: U.S. Census Bureau American Community Survey 2017, www.census.gov/



G.1.5 Population

In May 2019, the State Department of Finance released preliminary population data for the state to reflect wildfire-driven changes to local populations. The City of San Luis Obispo has a population of 46,802 persons as of January 2019, which accounts for approximately 16.7% of the County's population. The City experienced a growth of 0.1% from 46,741 residents from January 2018 (Department of Finance 2019). The U.S. Census Bureau's American Community Survey 2017 5-Year Estimates provide select demographic and social characteristics and changes from 2012 to 2017 for the City of San Luis Obispo (Table G.5).

Table G.5 City of San Luis Obispo's Demographic and Social Characteristics, 2012 to 2017

Characteristic	2012	2017
Population	270,121	280,119
Median Age	39.3	39.0
Total Housing Units	117,318	120,182
Housing Occupancy Rate	86.7%	87.4%
% of Housing Units with no Vehicles Available	4.5%	4.5%
Median Home Value	\$449,300	\$499,800
Unemployment	8.7%	4.8%
Mean Travel Time to Work (minutes)	20.9	21.8
Median Household Income	\$59,628	\$67,175
Per Capita Income	\$30,218	\$33,972
% of Individuals Below Poverty Level	13.7%	13.8%
# of Households	101,708	105,044
Average Household Size	2.49	2.51
% of Population Over 25 with High School Diploma	89.5%	90.5%
% of Population Over 25 with Bachelor's Degree or Higher	31.5%	34.0%
% with Disability	11.1%	11.1%
% Speak English less than "Very Well"	6.7%	6.8%

Source: U.S. Census Bureau American Community Survey 2017 5-Year Estimates, www.census.gov/

Between 1950 and 1990, the City grew from a population of 14,180 to just under 42,000. Since 1990, the City has maintained an average growth rate of less than one percent per year. Owner-occupied housing units account for 39% of all households, while approximately 61% of households are renter-occupied. The City's population is growing steadily at a relatively slow rate at approximately 1% or less per year with an estimated of 5.3% growth since the 2010 Census. The SLO 2035 Land Use and Circulation Elements update provides population estimates

**Table G.6 City of San Luis Obispo Population Growth**

Year	Approximate Maximum Number of Housing Units	Projected Population
2013	20,697	45,541
2015	21,113	46,456
2020	22,190	48,826
2025	23,322	51,317
2030	24,512	53,934
2035	25,762	56,686

Source: SLO 2035 Land Use Element Update

G.1.6 Development Trends

The City has traditionally expanded through annexation of County lands and increased development of diverse land uses; these include low to high density residential, general retail and commercial, services, and manufacturing uses bordering the San Luis Obispo Regional Airport, and dispersed undeveloped open space. With Mission Plaza and downtown at the heart of the City, development trends have included transition from the historic neighborhoods immediately adjacent to Downtown, to post-World War II growth in areas along the foothills of the Santa Lucia Mountains, surrounding Laguna Lake, and in the northern areas of town near the growing Cal Poly. Recent development efforts have focused on incorporating additional housing opportunities in the historic downtown core, through the renovation of historic structures and infill development on underutilized and vacant land. The Land Use Element of the City's General Plan provides designated land use and establishes development standards for new and existing structures and uses. The Safety Element further identifies hazards that may influence the locations and types of proposed land uses and provides policies that reduce exposure to hazards. These policies have also encouraged changes to development in San Luis Obispo's hazard prone/vulnerable areas, decreasing the City's vulnerability. Any future development within the City will be informed by the most up to date hazard maps as well as state and local development ordinances (e.g. floodplain) that restrict development in hazard prone areas to minimize risk.

In recent years, more residents and visitors are staying and living in the downtown core. This change in demographic could impact response capabilities if a hazard impacts the downtown core. The City also has a greenbelt protection program and have acquired thousands of acres of land around the City to minimize development in areas around the City. Thus, the redevelopment of already developed areas or infill development is likely to be the trend in the future.

Specific to hazards, continuing moderate population growth is increasing exposure to earthquake hazards, though new or re-developed areas built to modern codes will be more resistant to collapse and damage.

G.2 Hazard Identification and Summary

San Luis Obispo's planning team identified the hazards that affect the region and summarized their frequency of occurrence, spatial extent, potential magnitude, and significance specific to the City (see Table G.7). There are no hazards that are unique to the City. The overall hazard significance takes into account the geographic area, probability and magnitude as a way to identify priority hazards for mitigation purposes. This is discussed further in the Vulnerability Section.




Table G.7 City of San Luis Obispo – Hazard Summaries

Hazard	Geographic Area	Probability of Future Occurrence	Magnitude/Severity (Extent)	Overall Significance
Adverse Weather: Thunderstorm/ Heavy Rain/Hail/Lightning/Dense Fog/Freeze	Extensive	Likely	Limited	Medium
Adverse Weather: High Wind/ Tornado	Extensive	Occasional	Limited	Medium
Adverse Weather: Extreme Heat	Extensive	Occasional	Negligible	Low
Agricultural Pest Infestation and Disease	Limited	Highly Likely	Negligible	Medium
Biological Agents	Extensive	Occasional	Critical	Medium
Drought and Water Shortage	Extensive	Likely	Limited	Medium
Earthquake	Extensive	Occasional	Catastrophic	High
Flood	Limited	Occasional	Limited	Medium
Landslides and Debris Flow	Limited	Occasional	Limited	Low
Subsidence	Significant	Occasional	Negligible	Low
Wildfire	Significant	Occasional	Limited	Medium
Human Caused: Hazardous Materials	Significant	Highly Likely	Negligible	Medium
Geographic Area Limited: Less than 10% of planning area Significant: 10-50% of planning area Extensive: 50-100% of planning area Probability of Future Occurrences Highly Likely: Near 100% chance of occurrence in next year or happens every year. Likely: Between 10-100% chance of occurrence in next year or has a recurrence interval of 10 years or less. Occasional: Between 1 and 10% chance of occurrence in the next year or has a recurrence interval of 11 to 100 years. Unlikely: Less than 1% chance of occurrence in next 100 years or has a recurrence interval of greater than every 100 years.		Magnitude/Severity (Extent) Catastrophic—More than 50 percent of property severely damaged; shutdown of facilities for more than 30 days; and/or multiple deaths Critical—25-50 percent of property severely damaged; shutdown of facilities for at least two weeks; and/or injuries and/or illnesses result in permanent disability Limited—10-25 percent of property severely damaged; shutdown of facilities for more than a week; and/or injuries/illnesses treatable do not result in permanent disability Negligible—Less than 10 percent of property severely damaged, shutdown of facilities and services for less than 24 hours; and/or injuries/illnesses treatable with first aid Significance Low: minimal potential impact Medium: moderate potential impact High: widespread potential impact		





G.3 Vulnerability Assessment

The intent of this section is to assess the City's vulnerability separately from that of the County as a whole, which has already been assessed in Section 5 of the Base Plan. This vulnerability assessment analyzes the population, property, and other assets at risk to hazards ranked of medium or high significance specific to the City.

The information to support the hazard identification and risk assessment was based on a combination of the previous previous LHMP for the City and jurisdiction specific information collected during the 2019 update. A Local Hazard Mitigation Plan Update Guide and associated worksheets were distributed to each participating municipality or special district to complete during the 2019 update process. Information collected was analyzed and summarized in order to identify and rank all the hazards within the County, as well as to rank the hazards and identify the related vulnerabilities unique to each jurisdiction.

Each participating jurisdiction was in support of the main hazard summary identified in the Base Plan (See Table 5.2). However, the hazard summary rankings for each jurisdictional annex may vary slightly due to specific hazard risk and vulnerabilities unique to each jurisdiction (See Table G.7).

Note: The hazard "Significance" reflects overall ranking for each hazard and is based on the City of San Luis Obispo LPT member input from the Data Collection Guide and the risk assessment developed during the planning process (see Section 5 of the Base Plan), which included a more detailed qualitative analysis with best available data.

The hazard summaries in Table G.7 reflect the hazards that could potentially affect City. The discussion of vulnerability for each of the following hazards is located in subsection G.3.2 Estimating Potential Losses. Based on this analysis, the highest priority hazard (High Significance) for mitigation is Earthquake. Those of Medium or High significance for the City of San Luis Obispo are identified below.

- Adverse Weather: Thunderstorm/Heavy Rain/Hail/Lighting/Dense Fog/Freeze
- Adverse Weather: High Wind/Tornado
- Agricultural Pest Infestation and Disease
- Biological Agents
- Drought and Water Storage
- Earthquake
- Flood
- Human Caused: Hazardous Materials
- Wildfire

Other Hazards

Hazards assigned a significance rating of Low and which do not differ significantly from the County ranking (e.g., Low vs. High) are not addressed further in this plan. In the City of San Luis Obispo, those hazards are:

- Landslide and Debris Flow
- Adverse Weather: Extreme Heat
- Subsidence

Additionally, the City's HMPC members decided to rate several hazards as Not Applicable (N/A) to the planning area due to a lack of exposure, vulnerability, and no probability of occurrence. Dam Incidents, Coastal





Storm/Coastal Erosion/Sea Level Rise, and Tsunami and Seiche Hazards are considered Not Applicable (N/A) to the City of San Luis Obispo.

G.3.1 Assets at Risk

This section considers San Luis Obispo's assets at risk, including values at risk, critical facilities and infrastructure, historic assets, economic assets, and growth and development trends. The HMPC used a variety of data to define a baseline against which all disaster impacts could be compared. If a catastrophic disaster was to occur in the Planning Area, this section describes significant assets exposed or at risk in the City of San Luis Obispo.

Values at Risk

Parcel data was provided by ParcelQuest, a third-party service working alongside the San Luis Obispo County Assessor's Office to compile property information. This data provided the baseline for an inventory of the total exposure of developed properties within the county and helps to ensure that the updated HMP reflects changes in development. This data should only be used as a guideline to overall values in the City as the information has some limitations. The most significant limitation is created by Proposition 13; instead of adjusting property values annually, the values are not adjusted or assessed at fair market value until a property transfer occurs. As a result, overall value information is likely low and does not reflect current market value of properties. It is also important to note that in the event of a disaster, it is generally the value of the infrastructure or improvements to the land that is of concern or at risk. Generally, the land itself is not a loss. Table G.8 shows the exposure of properties (e.g., the values at risk) broken down by property type for the City of San Luis Obispo.

Table G.8 2019 Property Exposure for the City of San Luis Obispo by Property Types

Property Type	Property Count	Improved Value	Content Value	Total Value
Commercial	1,081	\$1,023,078,842	\$1,023,078,842	\$2,046,157,684
Government/Utilities	168	\$1,435,945	--	\$1,435,945
Other/Exempt/Misc.	507	\$189,186,968	--	\$189,186,968
Residential	8,226	\$1,896,071,588	\$948,035,794	\$2,844,107,382
Multi-Family Residential	2,885	\$811,851,931	\$405,925,966	\$1,217,777,897
Mobile/Manufactured Homes	156	\$25,110,344	\$12,555,172	\$37,665,516
Residential: Other	963	\$368,632,456	\$184,316,228	\$552,948,684
Industrial	42	\$60,310,187	\$90,465,281	\$150,775,468
Vacant	55	\$36,862,009	--	\$36,862,009
Total	14,083	\$4,412,540,270	\$2,664,377,282	\$7,076,917,552

Source: Wood analysis based on ParcelQuest and San Luis Obispo County Assessor's Office data 2019.

Critical Facilities and Infrastructure

Critical Facilities are essential in providing utility or direction either during the response to an emergency or during the recovery operation. These facilities typically include hospitals, fire stations, and local law enforcement stations, and according to FEMA should be given special consideration when formulating regulatory hazard





mitigation and floodplain management plans. See subsection 5.2 of the Base Plan for more details on the definitions and categories of critical facilities.

A portion of the critical facilities data was provided by the San Luis Obispo County Planning & Building and GIS Departments. Supplemental data from the Homeland Infrastructure Foundation-Level Data (HIFLD) was used to capture additional facilities such as law enforcement facilities and centers, communications facilities, emergency operations centers, schools, and urgent care facilities among others. In addition, participating jurisdictions identified assets on a data collection guide worksheet or in previous LHMPs which may capture additional facilities and additional details not within the GIS database. An inventory of critical facilities in the City of San Luis Obispo determined with San Luis Obispo County GIS data is provided in Table G.9 and illustrated in Figure G.2.





Figure G.2 Critical Facilities in the City of San Luis Obispo

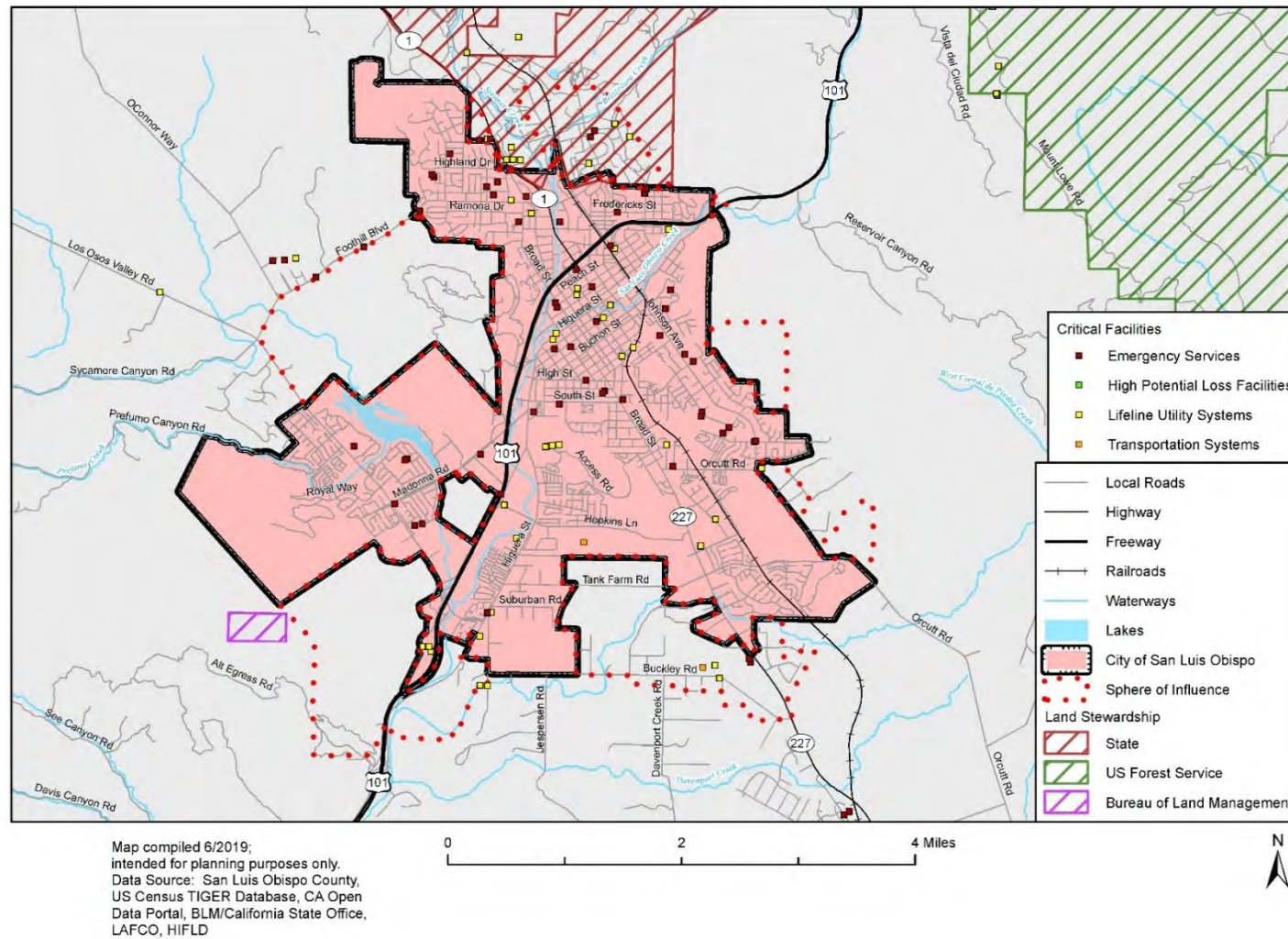



Table G.9 City of San Luis Obispo's Critical Facilities

Category	Asset Name	Asset IDs	Address	Replacement Value	Priority
Community and Recreational Facilities	City Hall	68	990 Palm St	\$9,287,080	Critical
	Library	451	995 Palm St	\$1,604,146	Essential
	Ludwick Community Center	452	864 Santa Rosa St	\$2,559,501	Critical
	Meadow Park Recreational Center	453	2333 Meadow St	\$1,448,126	Essential
	Mitchell Park Senior Center	456	1445 Santa Rosa St	\$1,068,158	Essential
	Sinsheimer Pool and Park	97-110	900 Southwood Dr	\$2,623,419	Essential
Infrastructure	Critical Bridges	10, 11, 19, 20, 23, 25, 27, 34, 35, 40, 41, 42, 44, 51, 56	Varies by bridge	Varies by bridge	Critical
	Essential Bridges	8, 9, 12-18, 21, 22, 24, 26, 28-33, 36-39, 43, 45-50, 52-55, 58, 59-62	Varies by bridge	Varies by bridge	Essential
	Higuera Box Culvert	57	Higuera St	\$4,500,000	Critical
	Evacuation Route Roads		50 miles	\$1 million/mile = \$50,000,000	Critical
	Other Essential City-Owned Roads		120 miles	\$1 million/mile = \$120,000,000	Essential
	Communication Towers	614,616,617		N/A	Essential
Other City-Owned Facilities	City Corporation Yard	426	25 Prado Rd	\$4,884,929	Critical
	Community Development and Public Works Administration	437	919 Palm St	\$23,081,375	Essential
	Parking Garage	477	Marsh and Chorro St	\$22,873,449	Essential
	Parking Garage	478	842 Palm St	\$8,795,686	Essential
	Parks and Recreation Building	479	1341 Nipomo St	\$1,282,662	Essential
	Prado Day Center	96	45 Prado Rd	\$699,393	Essential
	Utilities Administration	541	879 Morro St	\$1,060,252	Essential
Police and Fire Stations	Dispatch Center	78	1135 Roundhouse	\$6,701,098	Critical
	Fire Station #1	69	2160 Santa Barbara	\$5,483,205	Critical
	Fire Station #2	70	136 N Chorro St	\$511,872	Critical
	Fire Station #3	71	1280 Laurel Ln	\$594,009	Critical
	Fire Station #4	72	1395 Madonna Rd	\$507,087	Critical
	Police Main Building, Garage, Annex	73-77	1042 and 1016 Walnut St	\$4,854,341	Critical
Potable Water and Wastewater Facilities	Fire Station #4 Well	619	1395 Madonna Rd	N/A	Essential
	Pacific Beach Well	620	11950 LOVR	N/A	Essential
	Reservoirs	63-67		N/A	Essential
	Sewer Lift Stations	555-564		N/A	Essential
	Sewer System Infrastructure (pipes)			N/A	Essential
	Storm Drain System			N/A	Essential



Category	Asset Name	Asset IDs	Address	Replacement Value	Priority
	Waste Water Treatment Plant (includes Water/Wastewater Laboratory)	615	35 Prado Rd	\$77,296,765	Essential
	Water Pump Stations	1-7		N/A	Critical
	Water System Infrastructure (pipes)			N/A	Critical
	Water Tanks	566-613		N/A	Critical
	Water Treatment Plant and Stenner Hydro Plant	565	Stenner Creek Rd	\$51,486,423	Essential

Source: San Luis Obispo County Planning & Building, HIFLD

High Potential Loss Facilities

High potential loss facilities are considered critical facilities that present significant risks if damaged and include nuclear power plants, dams, and military installations. The City has one classified high potential loss facility: The San Luis Obispo Wastewater Treatment Plant (WWTP). The WWTP is located within a 100-year floodplain and within a moderate liquefaction risk zone; however, other potential hazard impacts are low.

Transportation and Lifeline Facilities

The City contains a network of roadways and public transportation including the Pacific Coast Railway. US Highway 101, Highway 1, and State Route 227 (Broad Street) provide regional access to the City. The San Luis Obispo County Regional Airport serves the City and is located in the southern portion of the jurisdiction.

Lifeline Utility Systems are defined as those systems necessary to provide electric power, natural gas, water and wastewater, and other facilities and services that are essential to the well-being of the City. Lifeline utility systems within the City include:

- AM Transmission Towers (1)
- FM Transmission Towers (1)
- Microwave Service Towers (52)
- Wastewater Treatment Plants (1)
- Energy Commission Facilities (7)

Historic and Cultural Resources

The City of San Luis Obispo has a wealth of historic and culturally significant resources due to its rich and varied history. Such resources represent the City's diverse historical context from periods prior to Chumash settlement and Spanish colonization, through early development and mid-century growth that established many of the existing neighborhoods and set a precedent for community design. The City of San Luis Obispo Citywide Historic Context Statement (2014) identifies various historical factors that shaped the development of the area, and provides a framework for the continuing process of identifying historic, architectural, and cultural resources in the City. The City has an active historic preservation program, and historic preservation is prioritized throughout City policy. City Zoning Regulations also establish the Historical Preservation Overlay Zone, which describes the allowed uses and property development standards within designated Historic Districts. Historic Districts within the City include Downtown Commercial District, the Mill Street District, the Old Town Neighborhood, the Little





Italy District, the Monterey Heights District, the Mount Pleasanton/Anholm District, the Chinatown Historic District, and the Railroad Districts.

Historical resources in the context of the City are also identified by the National Register of Historic Places (NRHP), the California Register of Historic Resources (CRHR), and the County of San Luis Obispo's List of Historic Resources in addition to local designation. Such resources are buildings, structures, objects, places, and areas that have an association with important persons, events in history, or cultural heritage, or have distinctive architecture, design or construction method. State and local registers of historic resources also identify Historical Points of Interest that have primarily local significance and interest in preservation. The City of San Luis Obispo has several registered national, state, and local sites of historic and cultural significance (Table G.10). County-wide historic resources are further detailed in Subsection 5.2, Asset Summary, of the Base Plan.

Table G.10 Historic Places

Historic Site	Register	Date Listed	Address
Ah Louis Store	State/National	1965	800 Palm Street
Angel Myron House	National	1982	714 Buchon St.
Corral de Piedra	National	1978	S of San Luis Obispo on Price Canyon Rd.
Dallidet Adobe	State	1960	1185 Pacific Street
Jack Robert House	National	1992	536 Marsh St.
Mission San Luis Obispo De Tolosa	State	1939	751 Palm Street
Monday Club of San Luis Obispo	National	2016	1815 Monterey St.
Pacific Coast Railway Company Grain Warehouse	National	1988	65 Higuera St.
Pereira Octagon Barn	National	2014	4400 Octagon Way
Port San Luis Site	National	1978	Address Restricted
The Powerhouse	National	1993	Junction of S/ Perimeter Rd. and Cuesta Ave
Rancho Canada de los Osos y Pecho y Islay	National	1975	Address Restricted
San Luis Obispo Carnegie Library	National	1995	696 Monterey St.
Tribune Republic Building	National	1993	1763 Santa Barbara St.
William Shipsey House	National	2010	1266 Mill St.
Camp San Luis Obispo	State Point of Interest	1990	NA
Hollister Adobe	State Point of Interest	1972	NA



Natural Resources

Natural resources are important to include in benefit-cost analyses for future projects and may be used to leverage additional funding for projects that also contribute to community goals for protecting sensitive natural resources. Awareness of natural assets can lead to opportunities for meeting multiple objectives. For instance, protecting wetlands areas protects sensitive habitat as well as attenuates and stores floodwaters.

The City's landscape is made up of creeks, hills, valleys, and rich farmland that supports a variety of plants and animal species. The San Luis Obispo area contains a diverse array of naturally occurring biological communities and extensive open space areas including the Irish Hills Natural Reserve, the Islay Hills Open Space, South Hills Open Space, Charles A. and Mary R. Maino Open Space, Ferrini Ranch, and the Laguna Lake Park and Open Space. The City's many creeks provide sheltered corridors that allow wildlife to move between dispersed habitats and open space areas.

Economic Assets

California Polytechnic State University is the largest employer in the City of San Luis Obispo with nearly 3,000 employees. San Luis Coastal Unified School District employs 384 regular classified employees. The industrial sector including education services, healthcare, and social assistance are the largest employers in the City at approximately 20.2% of the total employers. In 2007, approximately 5,127 individuals were employed in educational services, health care, and social assistance jobs. The General Plan Land Use Element (LUE) for the City includes policies to accommodate a maximum population of 57,200 persons. Assuming a 0.5% growth rate, the City would reach the anticipated residential capacity by year 2057. Tourism is an increasing trend in the City due to the diverse range of activities, small-town appeal and recent development of several hotels near and in the downtown core. Loss of a major employer from a hazard impact would result in a significant rise in unemployment and loss in sales tax revenue.

G.3.2 Estimating Potential Losses

Note: This section details vulnerability to specific hazards of high or medium significance, where quantifiable, and/or where (according to HMPC member input) it differs from that of the overall County.

Table G.9 above shows San Luis Obispo's exposure to hazards in terms of number and value of structures. San Luis Obispo County parcel and assessor data were used to calculate the improved value of parcels. The most vulnerable structures are those in the floodplain (especially those that have been flooded in the past), unreinforced masonry buildings, and buildings built prior to the introduction of modern-day building codes. Impacts of past events and vulnerability to specific hazards are further discussed below. (See subsection 5.1 Hazard Identification for more detailed information about these hazards and their impacts on the County as a whole.)

Adverse Weather: Thunderstorm/Heavy Rain/Hail/Lightning/Dense Fog/Freeze

Adverse weather in the City usually occurs as localized thunderstorms that bring heavy rains and strong winds, most often during the winter and spring months. Heavy rain has historically produced extensive flooding in the City. Dense fog can result in reduced visibility and slick road conditions that increase the likelihood for traffic accidents. Freeze is rarely a threat to human life in the City, but has the potential to impact agricultural operations where crop damage to high value products can be extensive. According to frost dates and temperature data published by the University of California Agriculture & Natural Resources, the lowest recorded temperature is 20°F, and average annual low temperatures of 42 to 43°F typically occur in January and December.





Adverse Weather: High Wind/Tornado

The City is subject to strong southeasterly winds associated with strong cold fronts and coastal storms, which generally occur during the winter months from November to February. Northwesterly winds that are typical of the central coast of California also occur throughout San Luis Obispo during the spring and summer. Both southeast and northwest wind events can reach sustained wind speeds of 35-45 mph with wind gusts of 65-75 mph within the City. Wind related events can have substantial destructive impacts, especially in urban areas where falling trees and branches can result in considerable property damage. Tornadoes have historically occurred in San Luis Obispo, with the first recorded tornado taking place in April 1926 due to a strong coastal storm front from the Pacific. Recorded tornadoes since then have typically been low severity, and caused minor damage such as broken tree branches and minor structural and roof damage to buildings. Refer to subsection 5.3.1 Adverse Weather, in the Base Plan for analysis related to tree mortality in the County of San Luis Obispo.

Agricultural Pest Infestation and Disease

Agricultural pests and pathogens (insects, fungi, bacteria, viruses and invasive plants) cause injury or destruction to crops or livestock. The prominent agricultural uses in San Luis Obispo County can be impacted by a wide variety of invasive pests, which pose a significant threat to crops, economy, food supply, and native habitat.

Biological Agents

Public health impacts due to biological agents are a recognized potential threat to the City. The City is largely reliant on the County's Emergency Preparedness Program, which supports the Public Health Department in the management and coordination of public health emergencies including natural disasters, technological disasters, bioterrorism incidents, and pandemics. Food and waterborne illnesses are major health problems that present significant health risks to the City as well as threats to regional food and water supply. The City supports and participates in the County Public Health Department's up-to-date Pandemic Influenza Plan and Strategic National Stockpile Plan to facilitate prevention, early detection, and treatment to effectively respond to pandemics.

Drought and Water Storage

Periods of drought can have significant environmental, agricultural, health, economic, and social consequences. Prolonged drought has the potential to impact structures due to subsidence, and can reduce water quality due to lower water flows and reduced pollutant dilution. The City recently experienced its third driest period on record since 1870 when weather observations began at the San Luis Obispo Polytech Weather Station. Long-term precipitation information from the station indicates the variability that can occur, which is summarized in Figure 5-4 in subsection 5.3.9 of the Base Plan. The City has invested in a multi-source water supply including Nacimiento, Whale Rock, and Santa Margarita Reservoirs, groundwater, and recycled water for landscape irrigation. Water demand modeling estimates that these sources provide a 7.5 year combined water supply, assuming an extended worst case historical drought.

Earthquake

Earthquake events have occurred in the City in the past, including a number of magnitude 5.0 to 7.0 earthquakes. Historically, most of the earthquakes that have occurred near the City have originated from movement along the San Andreas Fault, which lies approximately 35 miles northeast of the City. The most recent major earthquake to affect San Luis Obispo occurred at 11:15:56 am Pacific Standard Time on December 22, 2003. The epicenter of the magnitude 6.5 earthquake was approximately 7 miles northeast of San Simeon at a





depth of 4.7 miles (35.706N, 121.102W), 45 miles from San Luis Obispo. The City of San Luis Obispo experienced some minor damage. The main strand of the Los Osos fault zone, also known as the Edna fault zone, traverses the City near the intersection of Los Osos Valley Road and Foothill Boulevard. Field evaluations by the California Geological Survey (CGS) for the main strand of the Los Osos fault found evidence of movement in the last 11,000 years. This evidence of recent activity resulted in the establishment of an Earthquake Fault Zone by CGS in 1989 under the Alquist-Priolo Fault Zoning Act. The Los Osos fault specifically presents a high to very high fault rupture hazard to developments near and southwest of the Los Osos Valley Road area.

Table G.11 Seismic Hazard Designation by Property Type

Seismic Designation	Property Type	Property Count	Improved Value
Los Osos Alquist-Priolo	Residential	28	\$9,541,741
	Residential: Other	2	\$693,134
TOTAL		30	\$10,234,875

Source: San Luis Obispo County Planning & Building, County Assessor's Office, ParcelQuest, Wood Plc analysis

In addition to being at risk of groundshaking as a result of a fault rupture, the City of San Luis Obispo is also susceptible to the effects of liquefaction. Most of the City is underlain by alluvium and other liquefiable sediments that may present a risk of liquefaction during ground shaking; however, liquefaction risk is generally classified as low to medium on a scale of very low to very high. Liquefaction risk is visually displayed across the City under Figure G.4 below.

Table G.12 Parcels Susceptible to Moderate Liquefaction Risk

Parcel Type	Parcel Count	Improved Parcel Value
Commercial	992	\$964,747,104
Government/Utilities	125	\$1,435,945
Other/Exempt/Miscellaneous	418	\$170,684,946
Residential	5,282	\$1,076,982,642
Multi-Family Residential	2,387	\$678,902,288
Mobile/Manufactured Homes	148	\$16,744,811
Residential: Other	673	\$272,473,739
Industrial	36	\$55,659,992
Vacant	42	\$31,483,257
TOTAL	10,103	\$3,269,114,724

Source: San Luis Obispo County Planning & Building, County Assessor's Office, ParcelQuest, Wood Plc analysis



Figure G.3 Seismic Hazard Designation in the City of San Luis Obispo

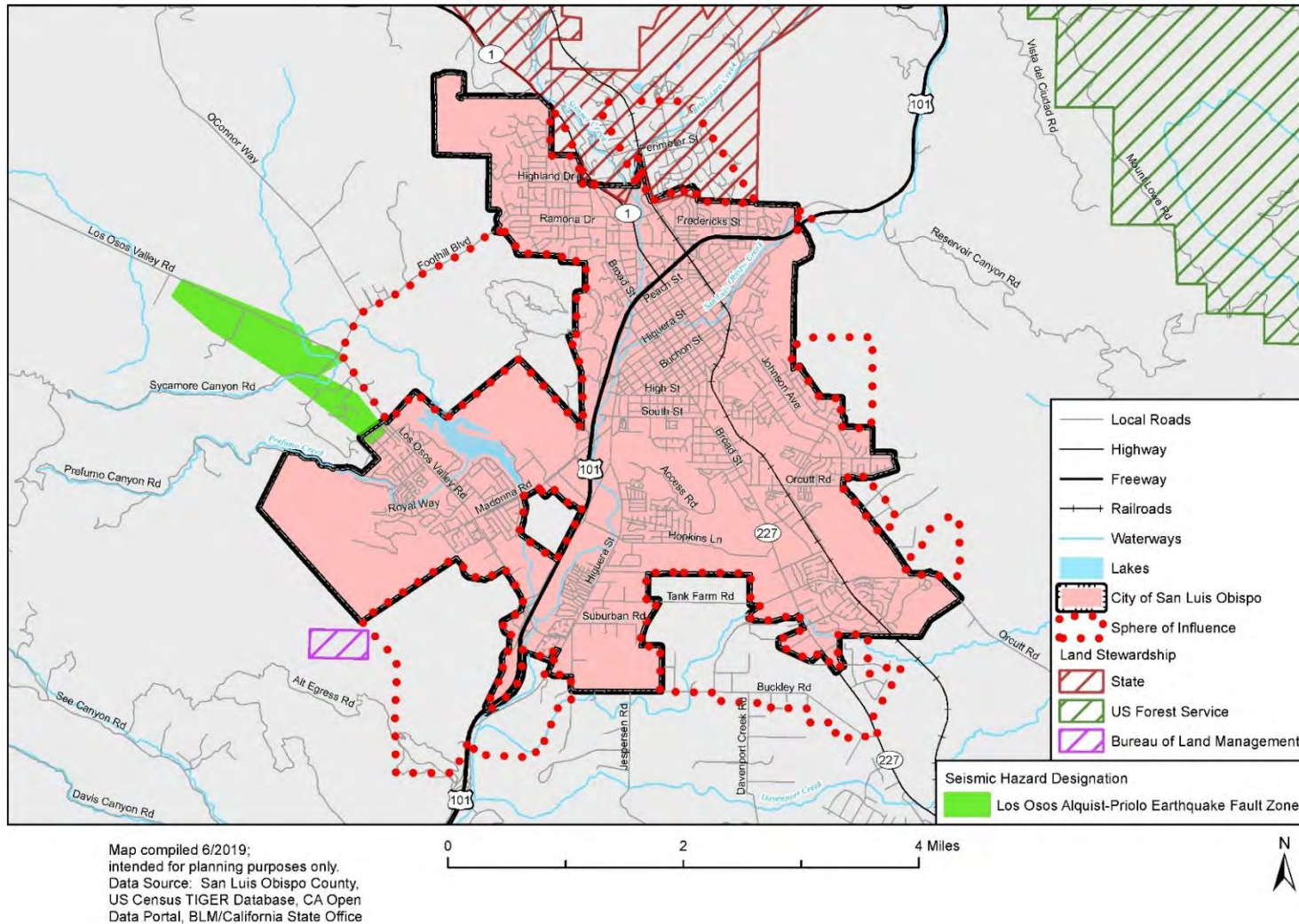
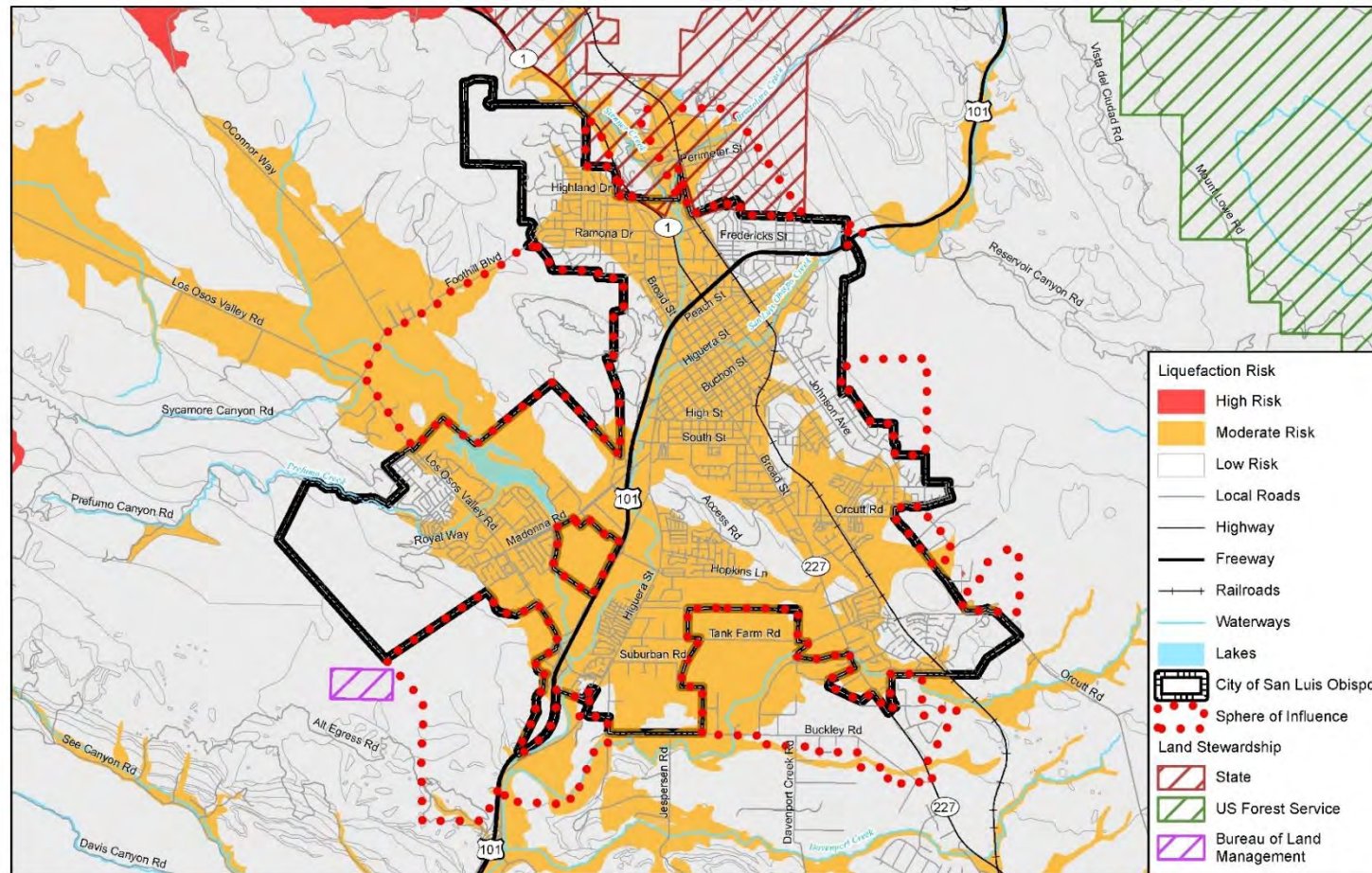




Figure G.4 Liquefaction Risk in the City of San Luis Obispo



Map compiled 6/2019;
intended for planning purposes only.
Data Source: San Luis Obispo County,
US Census TIGER Database, CA Open Data
Portal, BLM/California State Office, LAFCO

0 2 4 Miles





Flood

In San Luis Obispo, the most common type of flooding event is riverine flooding, also known as overbank flooding. Riverine floodplains range from narrow, confined channels in the steep valleys of mountainous and hilly regions, to wide, flat areas in plains and coastal regions. The amount of water in the floodplain is a function of the size and topography of the contributing watershed, the regional and local climate, and land use characteristics. Flooding in steep, mountainous areas is usually confined, strikes with less warning time, and has a short duration. Larger rivers typically have longer, more predictable flooding sequences and broad floodplains.

In addition to riverine flooding, San Luis Obispo is susceptible to flash flooding. Flash flood is a term widely used by experts and the general population, but no single definition or clear means of distinguishing flash floods from other riverine floods exists. Flash floods are generally understood to involve a rapid rise in water level, high velocity, and large amounts of debris, which can lead to significant damage that includes the tearing out of trees, undermining of buildings and bridges, and scouring of new channels. The intensity of flash flooding is a function of the intensity and duration of rainfall, steepness of the watershed, stream gradients, watershed vegetation, natural and artificial flood storage areas, and configuration of the streambed and floodplain. Urban areas are increasingly subject to flash flooding due to the removal of vegetation, installation of impermeable surfaces over ground cover, and construction of drainage systems. Wildfires that strip hillsides of vegetation and alter soil characteristics may also create conditions that lead to flash floods and debris flows. Debris flows are particularly dangerous due to the fact that they generally strike without warning and are accompanied by extreme velocity and momentum. Dam failure may also lead to flash flooding; however, the County's dam inundation as well as the California Office of Emergency Services dam inundation data confirms that there are no dam inundation zones located within the City limits.

The most serious flood events on record resulting in property damage or loss of life in San Luis Obispo occurred in 1868, 1884, 1897, 1911, 1948, 1952, 1962, 1969, 1973, 1993, 1995, 1998, and 2001. Recent damaging floods occurred during January and March of 1995, with a lesser flooding problem in 1998. Flow during these events overtopped streambanks near the intersection of Marsh and Higuera Streets and remained out of the channel for nearly three miles downstream, with damage estimated at nearly \$2.3 million. The City and Zone 9 spent approximately \$1 million to repair bank erosion caused during the winter of 1995. Damage occurred near the town of Avila during both the January and March 1995 events, where high flow and debris blockages caused extensive damage to several bridges across the creek. Flooding during 1969 was significantly damaging; two floods occurred, one at the end of January and the second at the end of February. During this two-month period, a local rain gage recorded an accumulated precipitation total of 39.79 inches. Historically, the 1969 and 1973 events were more damaging than the 1995 floods in present day dollars. The 1969 flood caused approximately \$6.92 million in damage within the SLO Creek watershed. The 1973 storm caused \$13.6 million along Stenner Creek, Brizzolari Creek, Prefumo Creek, and See Canyon Creek.

See Figure G.5 below illustrating the parcels at risk of flooding during a 100- or 500-year event based on the FEMA flood hazard areas.



**Table G.13 100-Year and 500-Year Flooding by Jurisdiction and Parcel Type**

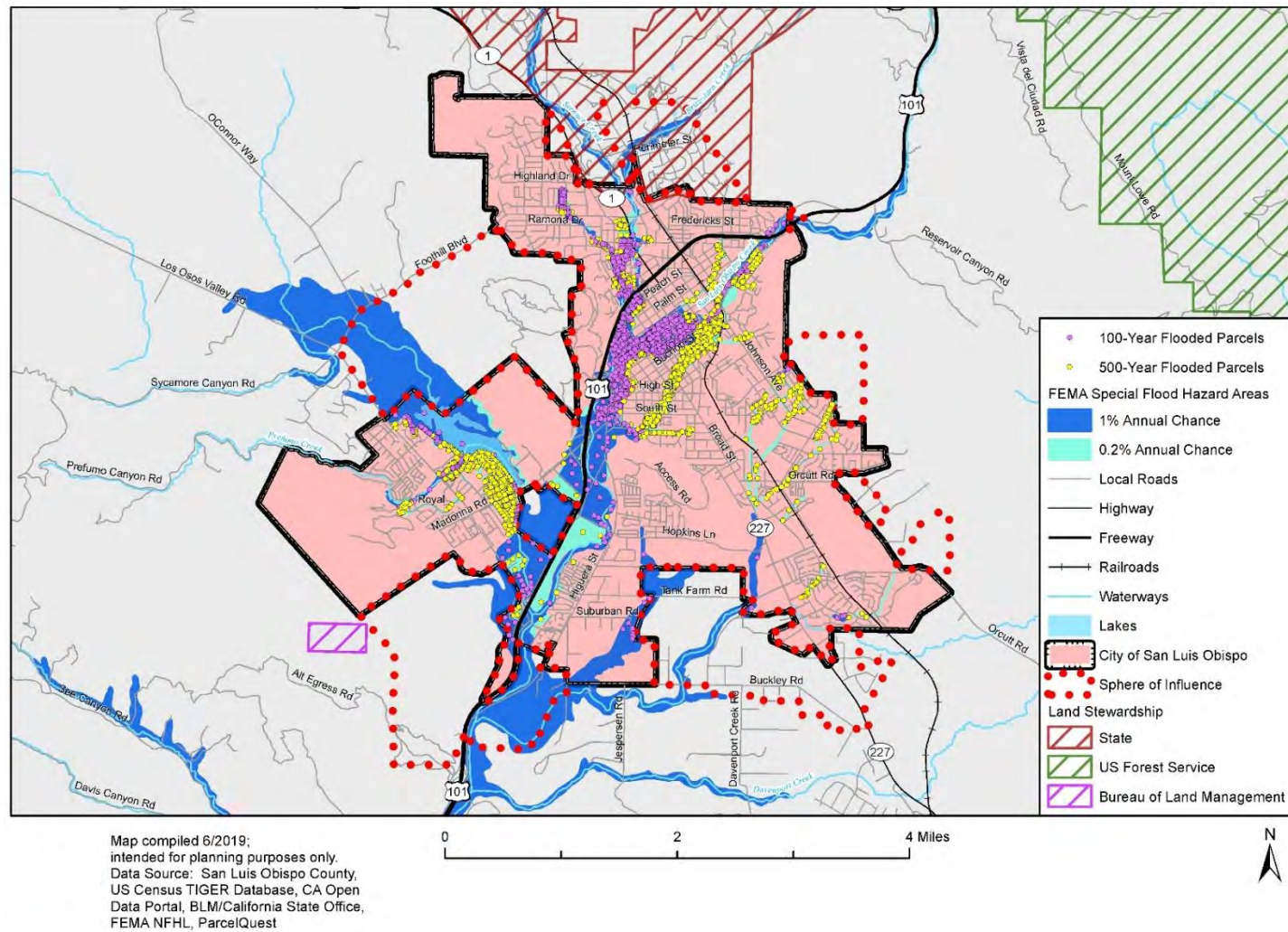
Parcel Type	Parcel Count	Improved Value	Content Value	Total Value	Loss Estimate	Population
100-YEAR FLOOD EVENT						
Commercial	307	\$310,143,384	\$310,143,384	\$620,286,768	\$155,071,692	--
Government/Utilities	29	\$10,050	--	\$10,050	\$2,513	--
Other/Exempt/Miscellaneous	75	\$29,586,337	--	\$29,586,337	\$7,396,584	--
Residential	338	\$71,676,715	\$35,838,358	\$107,515,073	\$26,878,768	848
Multi-Family Residential	209	\$66,889,696	\$33,444,848	\$100,334,544	\$25,083,636	525
Mobile/Manufactured Homes	5	\$591,404	\$295,702	\$887,106	\$221,777	13
Residential: Other	25	\$42,055,551	\$21,027,776	\$63,083,327	\$15,770,832	63
Industrial	6	\$2,632,168	\$3,948,252	\$6,580,420	\$1,645,105	--
Vacant	11	\$2,988,322	--	\$2,988,322	\$747,081	--
TOTAL	1,005	\$526,573,627	\$404,698,319	\$931,271,946	\$232,817,987	1,448
500-YEAR FLOOD EVENT						
Commercial	111	\$74,714,129	\$74,714,129	\$149,428,258	\$37,357,065	
Government/Utilities	8	--	--	\$0	\$0	--
Other/Exempt/Miscellaneous	35	\$19,148,234	--	\$19,148,234	\$4,787,059	--
Residential	971	\$190,774,098	\$95,387,049	\$286,161,147	\$71,540,287	2,437
Multi-Family Residential	297	\$66,546,672	\$33,273,336	\$99,820,008	\$24,955,002	745
Mobile/Manufactured Homes	1	\$245,631	\$122,816	\$368,447	\$92,112	3
Residential: Other	51	\$35,270,066	\$17,635,033	\$52,905,099	\$13,226,275	128
Industrial	1	\$312,120	\$468,180	\$780,300	\$195,075	--
TOTAL	1,475	\$387,010,950	\$221,600,543	\$608,611,493	\$152,152,873	3,313
GRAND TOTAL	2,480	\$913,584,777	\$626,298,862	\$1,539,883,439	\$384,970,860	4,761

Source: San Luis Obispo County Planning & Building, County Assessor's Office, ParcelQuest, Wood Plc analysis, FEMA NFHL





Figure G.5 Flood Hazard Areas and Flooded Parcels in the City of San Luis Obispo





Insurance Coverage, Claims Paid, and Repetitive Losses

The City of San Luis Obispo has been a participant in the National Flood Insurance Program since April 16, 1979, and will continue to participate and remain in compliance with the National Flood Insurance Program (NFIP).

Table G.14 City of San Luis Obispo NFIP Insurance Policy Information

Policies	Insurance in Force	No. of Paid Losses	Total Losses Paid
736	\$223,380,300	83	\$456,370

Source: FEMA National Flood Insurance Program Community Information System

FEMA Community Information System shows that as of April 2019 the City of San Luis Obispo has two Repetitive Loss (RL) properties and no Severe Repetitive Loss (SRL) properties.

Table G.15 City of San Luis Obispo Repetitive Loss

Repetitive Loss Properties	Insured Properties	Repetitive Loss Payments (total)
2	1	\$54,204.80

Source: FEMA National Flood Insurance Program Community Information System

The City of San Luis Obispo joined the Community Rating System (CRS) on October 1, 1991. Currently the City has a Class 6 rating.

Critical Facilities at Risk

Critical facilities are those community components that are most needed to withstand the impacts of disaster as previously described. There are eight critical facilities found in the 100-year floodplain in San Luis Obispo, and five critical facilities located in the City's 500-year floodplain. It is particularly important to note that the critical facilities in the 500-year floodplain are all facilities that serve vulnerable populations and should be given special attention. Table G.16 below summarizes the critical facilities in the City's 100- and 500-year floodplains. The impact to the community could be great if these facilities are damaged or destroyed during a flood event.

Table G.16 Critical Facilities in FEMA Flood Hazard Areas, City of San Luis Obispo

Floodplain	Critical Facility Type	Facility Count
100-year	Colleges / Universities	1
	Day Care Facilities	1
	Microwave Service Towers	3
	Nursing Homes	1
	VA Medical Facilities	1
	Wastewater Treatment Plant	1
500-year	Colleges / Universities	1
	Day Care Facilities	1
	Microwave Service Towers	1





Floodplain	Critical Facility Type	Facility Count
	Nursing Homes	1
	Private Schools	1
TOTAL		13

Source: San Luis Obispo County Planning and Building Dept., LAFCO, HIFLD, Wood Plc Parcel Analysis, FEMA NFHL

Wildfire

The risk of wildland fires is greatest near the City limits where development meets rural areas of combustible vegetation. Most of the community is within one mile of a High or Very High Fire Hazard Severity Zone, which indicates significant risk to wildland fire. The City of San Luis Obispo is confronted with one of the more hazardous wildfire risks in the County due to its location near the foothills of the Santa Lucia Mountains and the Irish Hills, with increased wildfire risk in these foothills as well as on Chumash Peak, Bishop Peak, Cerro San Luis, and Islay Hill. Figure G.6 illustrates, in map form, the wildfire hazard severity zones that cross over into the City and hence pose risk to the community and its people.

Table G.17 Properties Within Moderate and Very High Wildfire Hazard Severity Zones

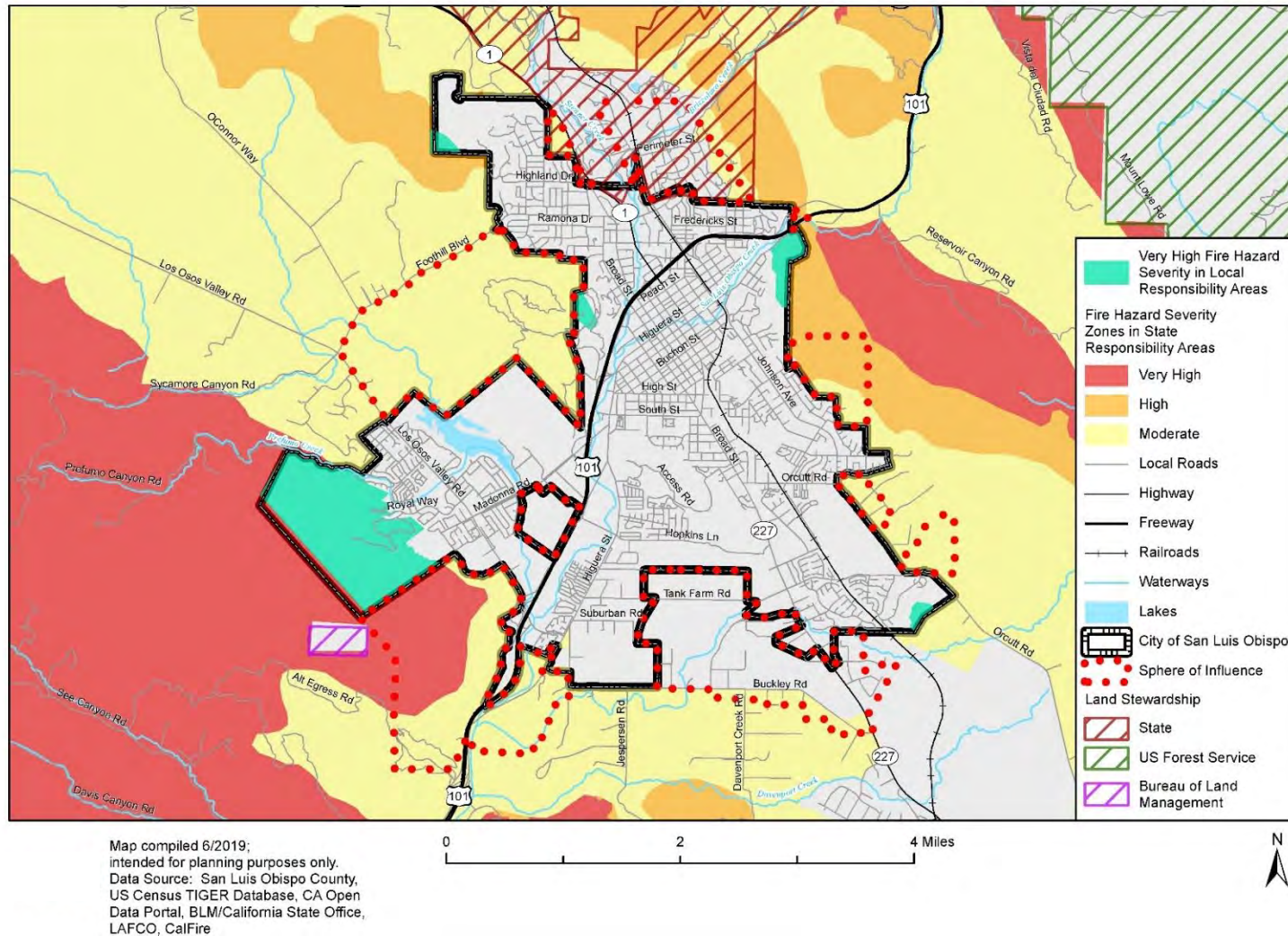
Parcel Type	Parcel Count	Improved Value	Content Value	Total Value	Loss Estimate	Population
MODERATE WILDFIRE HAZARD SEVERITY						
Commercial	1	\$2,392,765	\$2,392,765	\$4,785,530	\$4,785,530	--
Government/Utilities	1	--	--	\$0	\$0	--
Other/Exempt/Miscellaneous	1	--	--	\$0	\$0	--
Residential	3	\$218,358	\$109,179	\$327,537	\$327,537	8
TOTAL	6	\$2,611,123	\$2,501,944	\$5,113,067	\$5,113,067	8
VERY HIGH WILDFIRE HAZARD SEVERITY						
Other/Exempt/Miscellaneous	2		--	\$2	\$2	--
Residential	14	\$7,928,870	\$3,964,435	\$11,893,319	\$11,893,319	35
Vacant	1	\$40,500	--	\$40,501	\$40,501	--
TOTAL	17	\$7,969,370	\$3,964,435	\$11,933,822	\$11,933,822	35
GRAND TOTAL	23	\$10,580,493	\$6,466,379	\$17,046,889	\$17,046,889	43

Source: San Luis Obispo County Planning & Building, County Assessor's Office, ParcelQuest, Wood Plc analysis, CalFire





Figure G.6 Wildfire Hazard Severity Zones





Human Caused: Hazardous Materials

The Cal OES Warning Center reports 419 hazardous materials incidents in the City of San Luis Obispo from 1994 through October 24, 2018; as noted in subsection 5.3.16 of the county plan, this likely excludes a large number of unreported minor spills. This constitutes 23% of the hazardous materials incidents reported county-wide during the same time frame, and averages out to roughly 16.8 incidents per year. As noted in subsection 5.3.16, only around 6% of reported hazardous materials incidents result in injuries, fatalities, or evacuations.

There is one CalARP regulated facilities and no EPA Risk Management Plan (RMP) facilities located in the City. Additionally, the City sits within the Emergency Planning Zone for the Diablo Canyon Nuclear Power Plant.

G.4 Capability Assessment

Capabilities are the programs and policies currently in use to reduce hazard impacts or that could be used to implement hazard mitigation activities. This capability assessment is divided into six sections: regulatory mitigation capabilities, administrative and technical mitigation capabilities, fiscal mitigation capabilities, mitigation outreach and partnerships, other mitigation efforts, and opportunities for enhancement.

To develop this capability assessment, the jurisdictional planning representatives used a matrix of common mitigation activities to inventory policies or programs in place. The team then supplemented this inventory by reviewing additional existing policies, regulations, plans, and programs to determine if they contributed to reducing hazard-related losses.

During the plan update process, this inventory was reviewed by the jurisdictional planning representatives and Wood consultant team staff to update information where applicable and note ways in which these capabilities have improved or expanded. In summarizing current capabilities and identifying gaps, the jurisdictional planning representatives also considered their ability to expand or improve upon existing policies and programs as potential new mitigation strategies. The City of San Luis Obispo's updated capabilities are summarized below.

G.4.1 Regulatory Mitigation Capabilities

Table G.18 City of San Luis Obispo Regulatory Mitigation Capabilities

Regulatory Tool (ordinances, codes, plans)	Yes/No	Comments
General Plan	Yes	Land Use Element, Circulation Element, Housing Element, Noise Element, Safety Element, Conservation and Open Space Element, Parks and Recreation Element, and Water and Wastewater Element
Zoning ordinance	Yes	Title 17: Zoning Regulations of the City of San Luis Obispo Municipal Code
Subdivision ordinance	Yes	Title 16: Subdivisions, Subdivision Regulations
Growth management ordinance	Yes	Chapter 17.144: Residential Growth Management Regulations
Floodplain ordinance	Yes	Chapter 17.78: Flood Damage Prevention
Other special purpose ordinance (stormwater, steep slope, wildfire)	Yes	Ordinance 1543: Chapter 12.08 Urban Storm Water Quality Management and Discharge Control Ordinance 1490: Chapter 16.20 Physical Improvement Standards and Procedures - 16.20.040 Grading plan Ordinance 1490: Chapter 16.18 General Subdivision Design Standards





Regulatory Tool (ordinances, codes, plans)	Yes/No	Comments
		<p>Chapter 17.70.090: Hillside Development Standards Ordinances 1630 (part) and 1595 (part), Chapter 15.04 Construction and Fire Prevention Regulations</p> <p>A Stormwater Control Plan is required to be submitted for all projects to demonstrate exemption or level of compliance required. Post Construction Regulation outlines Stormwater Control Plan content in Performance Requirement 2 - Sections B.3.c, Performance Requirement 3 - Section B.4.g, and Performance Requirement 4 – Section B.5.b. Through the Stormwater Control Plan submittal, applicants demonstrate compliance with Post Construction Requirements or exemption status.</p> <p>Drainage Design Manual (Design Manual) has been developed to provide criteria and planning procedures for floodplains, waterways, channels, and closed conduits in the San Luis Obispo Creek watershed. This Drainage Manual will be used by the City of San Luis Obispo and San Luis Obispo County Flood Control and Water Conservation District Zone 9 (SLO/Zone 9) staff in their internal design of stormwater drainage, flood management and bank stabilization and restoration projects.</p>
Building code	Yes	<p>Title 15, Buildings and Construction of the City of San Luis Obispo Municipal Code. California Building Codes: CA Residential Code (2016); CA Plumbing Code (2015 UPC); CA Mechanical Code (2015 UMC); CA Electrical Code (2014 NEC); CA Energy Code (2016); CA Green Building Code (2016); CA Fire Code (2015 IFC); CA Reference Standards Code (2016)</p>
Fire department ISO rating	Yes	2
Erosion or sediment control program	Yes	<p>Chapter 17.78 Flood Damage Prevention Chapter 12.08 Urban Storm Water Quality Management and Discharge Control Chapter 16.20 Physical Improvement Standards and Procedures Ordinance 1543, Code Section 12.08.150 Requirement to prevent, control, and reduce storm water and pollutants City of SLO Waterway Management Plan and Drainage Design Manual</p> <p>Annual silt removal to maintain hydraulic capacity in San Luis Obispo creek beds to reduce flooding. City has 14 total sites in the management plan and complete silt removal on a rotating basis.</p>
Stormwater management program	Yes	Chapter 12.08: Stormwater Regulations & Requirements
Site plan review requirements	Yes	Title 22 Article 3
Capital improvements plan	Yes	Department of Public Works 5-Year Strategic Plan
Economic development plan	Yes	5-Year Economic Development Strategic Plan Updated in 2015
Local emergency operations plan	Yes	City of San Luis Obispo Emergency Operations Plan (2011)
Other special plans	Yes	Open Space Conservation Plans, Climate Action Plan, Urban Water Management and Water Shortage Contingency Plans, Waterway Management Plan, Utilities Department Emergency Plan,





Regulatory Tool (ordinances, codes, plans)	Yes/No	Comments
		Unreinforced Masonry Hazard Mitigation Program, Disaster Preparedness Program, Community Wildfire Preparedness Plan, Greenbelt Protection Program
Flood insurance study or other engineering study for streams	Yes	2012
Elevation certificates (for floodplain development)	Yes	Chapter 17.78: Flood Damage Prevention
Other	Yes	Water System Vulnerability Assessment, Floodplain Management Educational Program

G.4.2 Administrative/Technical Mitigation Capabilities

There are several key departments and staff within the City organization that serve a specific role in developing and implementing hazard mitigation activities. City government consists of approximately 399 full-time equivalent employees and 10 departments: Police, Fire, Public Works, Public Utilities, Community Development, Parks and Recreation, Human Resources, Finance and Information Technology, City Administration, and the City Attorney's Office. With a clear set of policies in place and a diverse range of staff available to mitigate identified hazards within the City, the City has many staff with specific training on the use of specialized equipment or particular areas of expertise that are essential in implementing mitigation actions. Technical resources are considered to be physical infrastructure or equipment available to the City to aid in implementing hazard mitigation or disaster response activities. Table G.19 identifies the personnel resources and technical resources that increase capabilities related to mitigation and loss prevention in the City.

Table G.19 City of San Luis Obispo Administrative/Technical Mitigation Capabilities

Personnel Resources	Yes/No	Department/Position
Planner/engineer with knowledge of land development/land management practices	Yes	Staff with knowledge of land development practices and local land development patterns.
Engineer/professional trained in construction practices related to buildings and/or infrastructure	Yes	Professionals trained in construction practices associated with buildings and infrastructure and in storm water compliance during construction and operation of buildings and infrastructure projects.
Planner/engineer/scientist with an understanding of natural hazards	Yes	
Personnel skilled in GIS	Yes	Provide accurate and comprehensive Geographic Information System for managing resources, make informed decisions, and expedite work processes.
Full time building official	Yes	Community Development Department, Chief Building Official
Floodplain manager	Yes	Community Development Department, Supervising Civil Engineer
Emergency manager	Yes	Accomplished through contract services. City maintains funding for the 2019-21 Financial Plan to maintain an Emergency Manager position equivalent to 0.5 FTE.
Grant writer	Yes	Accomplished through Contract Services. The City maintains two-year contracts with both a local grant writing firm and grant advocate firm based out of Irvine, CA.





Personnel Resources	Yes/No	Department/Position
Mutual Aid Agreements	Yes	Establishes agreements among local jurisdictions to assist in emergency response efforts in neighboring jurisdictions during times of need. San Luis Obispo currently participates in the following mutual aid agreements: 1. California Master Mutual Aid Agreement, 2. SLO County Fire and Rescue Mutual Aid Agreement, 3. California Fire Assistance Agreement, 4. Region 1A Law Enforcement Mutual Aid Agreement, 5. Public Works Mutual Aid Agreement, 6. California Emergency Managers Mutual Aid Agreement, 7. Regional Disaster Medical/Health Coordination.
Code Enforcement and Neighborhood Services	Yes	Staff with training and expertise in identifying hazards to health, safety, and welfare, and assisting property owners with achieving code and policy compliance.
Fire Marshal	Yes	Measure G funded position, manages and directs the activities of the Fire Prevention Bureau. Oversees fire safety inspections for all facilities in the City. Ensures that development in the City meets fire safety standards. Obtains funding and implements wildland fuel reduction projects. Directs and oversees fire investigations.
Fire Inspectors	Yes	Professionals trained in fire prevention techniques and construction practices associated with buildings and infrastructure. Inspect all multi-family residential buildings and public assembly buildings. Review building plans and inspect construction projects for fire and life safety and proper installation of fire protection systems. Investigate fire for cause and origin.
Hazardous Materials Coordinator		Staff designated to inspect facilities and containers storing hazardous materials. There are approximately 244 facilities located within the City that are permitted for the use of hazardous materials.
Network Administrators	Yes	Provide technical support for wired/wireless network and radios.
Park Rangers	Yes	Staff familiar with brush clearance requirements and conditions of City-owned open space.
Police Officers	Yes	Emergency response to provide protection of life, property and address community safety/security needs. Work cooperatively with other first responders for an organized response to disaster mitigation plans.
Dispatchers	Yes	Provide communication links to responding personnel to transfer emergency information and direct resources as needed.
Construction Inspection	Yes	Ensures storm water compliance during construction of City projects, and private grading and encroachment projects.
Public Works Department – Department Operations Centers (DOC)	Yes	The Public Works DOC coordinates responses to road flooding and related problems during a storm with road crews, the County, Caltrans, and the California Highway Patrol. They also support other emergency response operations coordinated through the City's EOC.
Storm Water Compliance	Yes	Staff responsibility assigned to ensure storm water compliance during construction and operation of buildings and infrastructure projects.
Other personnel	Yes	Operations: Field staff provide assistance to Public Works DOC for flood response, and City EOC for general emergency response.





Personnel Resources	Yes/No	Department/Position
GIS Data Resources (Hazard areas, critical facilities, land use, building footprints, etc.)	Yes	
Warning systems/services (Reverse 9-11, outdoor warning signals)	Yes	
Voluntary Organizations Active in Disaster	Yes	Provides disaster preparedness courses to residents and community members and provides care and shelter to those threatened or impacted by natural hazards. Volunteer and private agencies are essential to the area's mutual aid system by providing for the care and shelter needs of disaster victims. Organizations active in San Luis Obispo include the American Red Cross and Salvation Army.

G.4.3 Fiscal Mitigation Capabilities

There are multiple financial and funding opportunities for the City to mitigate or respond to natural hazards. These capabilities include local revenues from the general fund, or the receipt of grant funds from state or federal agencies. The City's financial planning process includes a two-year goal setting and budget development based on community and council priorities. The City's five-year fiscal forecast identifies the City's forecast of revenues, expenditures, and changes in fund balance. The general fund receives revenues from a variety of sources including taxes (sales, property, transient occupancy, business, utility users), subventions and grants (vehicle license fees, gas tax, and other subventions), service charges (development review fees, recreation fees), and other revenues (fines, interest earnings, and rents). The City has and will continue to utilize the two-year goal setting and budget process to prioritize expenditures needed to mitigate future hazards. In the event of a natural disaster and a need for immediate City response, the City has the financial capacity to utilize reserve funds, when authorized by the City Council. The City has previously utilized the following financial resources to implement hazard mitigation activities. The added revenues to the General Fund from Measure "G" have allowed the City to financially support major improvements in the areas of public safety, flood protection, and open space preservation. Financial resources to mitigate hazards: Table G.20 identifies financial tools or resources that the City could potentially use to help fund mitigation activities.

Table G.20 City of San Luis Obispo Fiscal Mitigation Capabilities

Financial Resources	Accessible/Eligible to Use (Yes/No)	Comments
Community Development Block Grants	Yes	The City continues to seek grant opportunities through the CDBG program and identify potential eligible projects that would fund mitigation activities to benefit the health and welfare of the community.
Capital improvements project funding	Yes	The Capital Improvement Plan (CIP) enables the City to plan, schedule, and finance capital projects to ensure cost effectiveness and conformance with established plans and policies. The City's budget process guides the capital priorities through community input, Council goal setting, Local Revenue Measure priorities, and the biennially adopted Major City Goal work programs. The City's CIP includes all planned infrastructure projects over a five-year period. The first two years identify those projects that are planned to be funded and/or completed during the adopted two-year





Financial Resources	Accessible/Eligible to Use (Yes/No)	Comments
		financial plan. The latter three years serve as the framework for future Financial Plans' capital budgets. The plan represents a phased approach to funding the projects needed to maintain the City's infrastructure and major facilities over the entire five-year period.
Authority to levy taxes for specific purposes	Yes	Taxes for specific purposes can be levied with authorization from the City Council and further approval through a local ballot measure.
Fees for water, sewer, gas, or electric services	Yes	The City's utilities department provides water and wastewater services to the residents and businesses of San Luis Obispo. Water and sewer revenues are collected to support operations and capital improvements, with rates reviewed on an annual basis and approved by the City Council. These revenues from customer water and sewer use are utilized by the utilities department to maintain, improve, expand and replace components of the City's water and wastewater infrastructure system, including improvements made to protect from natural hazards.
Impact fees for new development	Yes	New development projects proposed in the City affect the City's ability to provide adequate essential services (e.g. transportation, water and wastewater, and open space). To ensure these essential services can adequately serve the City's existing and future community needs, a series of development impact fees are levied on new development projects.
Incur debt through general obligation bonds	Yes	Debt can be incurred through general obligation bonds with authorization from the City Council and further approval through a local ballot measure.
Incur debt through special tax bonds	Yes	Debt can be incurred through special tax bonds with authorization from the City Council and further approval through a local ballot measure.
Incur debt through private activities	Yes	City Financial Policy allows debt to be incurred through private activities with approval from City Council
Withhold spending in hazard prone areas	Yes	Policy is accessible with authorization from City Council.
General Fund (including Measure G Funding)	Yes	In 2006, City voters approved measure Y to preserve and enhance essential City services by establishing a 1/2 –cent City sales tax. In the 2011/12 fiscal year, measure Y generated approximately \$6.2 million in revenue. This funding has been used in recent years for public safety, infrastructure maintenance, traffic congestion relief, neighborhood code enforcement and open space acquisition project. Many of the projects funded through measure Y revenues are considered to help mitigate hazard throughout the community. In 2014 Measure Y was approved to be extended through ballot measure G, which will sunset in 2022 unless a new measure is passed to continue the collection of additional sales tax.





Financial Resources	Accessible/Eligible to Use (Yes/No)	Comments
Reserve Funds	Yes	The City's budget and fiscal policies includes a requirement to maintain adequate fund reserves for both general and enterprise funds. The minimum reserve level is 20% of annual operating expenditures.
Building Permit Inspection and Review Fees	Yes	Fees are collected by the planning and building divisions of the community development department to inspect and review construction documents on proposed projects within the City. The collection of these fees ensures buildings are designed and constructed in a manner consistent with applicable components of the municipal code and helps the department to recover staff costs associated with review and inspection.

G.4.4 Mitigation Outreach and Partnerships

Throughout the planning process of the Multi-jurisdictional HMP, the City participated in local outreach by promoting public meetings and circulating the Public Draft of the HMP for public comment and review. Public comments have been addressed and have been incorporated into the final HMP, where applicable. To further support implementation of hazard mitigation activities, the City has established strong partnerships with its neighboring jurisdictions, San Luis Obispo County, and multiple state organizations such as the California Highway Patrol, Cal Poly, CalFire, and Caltrans to collectively address local hazards. These partnerships have been formalized through the following:

- Mutual Aid Agreements
- Voluntary Organizations Active in Disaster
- San Luis Obispo County Community Fire Sage Council
- Department Operations Centers (DOC)

The City of San Luis Obispo also coordinates with many external (local, state, federal, and private sector) agencies which have capabilities to support hazard mitigation activities. Many of these agencies participated in the hazard mitigation planning process to update this plan, including the following:

- County of San Luis Obispo – Airports
- County of San Luis Obispo – Office of Emergency Services
- County of San Luis Obispo – Public Health Department
- Cal Poly – City & Regional Planning Department
- Cal Poly – Administration and Finance
- French Hospital Medical Center
- American Red Cross
- Sierra Vista Regional Medical Center
- San Luis Coastal Unified School District
- California Highway Patrol
- Pacific Gas and Electric Company (PG&E)





G.4.5 Other Mitigation Efforts

In addition to the plan and policy resources available to the City to mitigate hazards, the City has developed or participated in several hazard mitigation programs including:

- Unreinforced Masonry Hazard Mitigation Program
- Disaster Preparedness Program
- Floodplain Management Educational Program
- San Luis Obispo Chamber of Commerce Business Continuity Planning
- County Public Health Emergency Preparedness Advisory Committee
- National Flood Insurance Program (NFIP) and FEMA Repetitive Loss Properties
- Community Wildfire Protection Program
- Greenbelt Protection Program

G.4.6 Opportunities for Enhancement

Based on the capability assessment, the City has several existing mechanisms in place that help to mitigate hazards. There are also opportunities for the City to expand or improve on these policies and programs to further protect the community. Future improvements may include providing training for staff members related to hazards or hazard mitigation grant funding in partnership with the County and Cal OES. Additional training opportunities will help to inform City staff members on how best to integrate hazard information and mitigation projects into their departments. Continuing to train City staff on mitigation and the hazards that pose a risk to the City will lead to more informed staff members who can better communicate this information to the public.

The following themes or opportunities were identified during the planning process of the 2014 LHMP:

- Actions to Prepare – While many members of the community have taken small actions to prevent damage to their home in the event of a natural hazard, only a small portion have completed larger structural items to prevent damage. The City may consider developing and implementing programs to support risk reduction activities by property owners. Using the data available as a result of the risk assessment in this HMP, the City is able to identify areas and structures with a higher risk or exposure to the identified hazards. Sharing this information with community members and evaluating opportunities to help property owners in funding risk reduction activities will increase the resiliency of San Luis Obispo.
- Awareness of Neighbor Needs – Given the high student population and regular turnover of neighbors in some neighborhoods, it can be challenging for community members to be fully aware of neighbors and their needs. Neighborhood events such as the annual community block parties are an opportunity for the City to support greater community interaction which can increase awareness of neighbors needs in the event of an emergency.
- Community or Workplace Awareness – In many cases, respondents were unaware or unsure of the hazards that may affect the community or their workplace and policies that may be in place to help respond to a natural disaster. The City can help to increase community awareness through wider promotion or participation in workshops or resources available to the community that have already been prepared by the City or volunteer organizations. The City may increase business owners' awareness of risk by providing emergency planning support, continuity of operations planning support, and potentially hosting seminars for the business community to learn about the hazard risks.
- Understanding the Extent of Damages – To better understand the extent of damages to homeowners from a natural disaster, the City could coordinate with homeowner insurance providers to track damages beyond those reported through the National Flood Insurance Program (NFIP).





G.5 Mitigation Strategy

G.5.1 Mitigation Goals and Objectives

The City of San Luis Obispo Planning Team determined the two goals from the 2014 LHMP continue to be appropriate for this plan update, with the addition of a third goal to address hazards exacerbated by the impacts of climate change. The following are the City of San Luis Obispo's 2019 mitigation goals:

- **Goal 1:** Cultivate a disaster-resistant and resilient community through implementation of risk reduction measures and increased public awareness to prepare for, respond to, and recover from natural and human-caused hazard events.
 - **Objective 1.A** Ensure that local plans, policies, and programs are consistent with the hazard information identified in the LHMP.
 - **Objective 1.B** Increase City employee capacity through SIMS and NIMS compliant training and EOC drills to identify hazards, and assist in emergency preparedness, response, and recovery.
 - **Objective 1.C** Pursue available grant funding to implement hazard mitigation efforts.
 - **Objective 1.D** Maintain critical and essential key assets to increase resiliency and minimize future damage from hazard events.
 - **Objective 1.E** Increase public awareness of hazards, emergency response, and recovery.
 - **Objective 1.F** Promote public/private partnerships to increase community resiliency.
- **Goal 2:** Reduce the severity of damage and losses due to natural and human-caused hazards.
 - **Objective 2.A** Protect and enhance, as practical, existing assets, as well as any future development, from the effects of natural and human-caused hazards.
- **Goal 3:** Prepare for and adapt to the impacts of climate change.
 - **Objective 3.A** Use, and update as needed, the best available science to estimate exposure, vulnerability, and risk of hazards as the result of climate change.
 - **Objective 3.B** Use the climate change exposure, vulnerability, and risk assessments to ensure mitigation investments, capital projects, and programs actively mitigate climate impacts.

Continued Compliance with the National Flood Insurance Program (NFIP)

The City has been an NFIP participating community since 1973 and will continue to comply with the NFIP. This includes ongoing activities such as enforcing local floodplain development regulations, including issuing permits for appropriate development in Special Flood Hazard Areas and ensuring that this development is mitigated in accordance with the regulations. This will also include periodic reviews of the floodplain ordinance to ensure that it is clear and up to date and reflects new or revised flood hazard mapping. The goals of the NFIP are to reduce future flood damage through floodplain management and to provide people in participating communities with flood insurance. Community participation is voluntary. The City is also part of the Community Rating System (CRS), currently rated at Class 7. The goals of the CRS are to reduce flood damages to insurable property, strengthen and support the insurance aspects of the NFIP, and encourage a comprehensive approach to floodplain management. The City of San Luis Obispo maintains full compliance with the NFIP through Sections 17.84.010- 17.84.170 within Chapter 17.84 Flood Damage Prevention Regulations of the San Luis Obispo Municipal Code, which sets forth means to reduce losses from floods. These standards focus on areas located within or near the 100-year floodplain. Section 8.12.010-8.12.010 of the Municipal Code provides a mechanism for the City to require the removal of dangerous obstructions in streambeds that have the potential to obstruct water flow.





FEMA insures properties against flooding losses through the NFIP. As part of the process to reduce or eliminate repetitive flooding to structures across the United States, FEMA has developed an official Repetitive Loss Strategy. The purpose behind the national strategy is to identify, catalog, and propose mitigation measures to reduce flood losses due to the relatively few structures that represent the majority of claims from the National Flood Insurance Fund. A Repetitive Loss property is defined by FEMA as a "property for which two or more NFIP losses of at least \$1,000 each have been paid within any 10-year period since 1978." The City of San Luis Obispo has two Repetitive Loss properties. As a CRS requirement, the City Public Works Department sends community outreach notifications and letters to property owners in repetitive loss areas, including the City's Mid Higuera Area, to inform residents of flooding and to offer ways in which property owners can prepare for and reduce the damage from repetitive flooding. In addition, the Public Works Department conducted storm drain improvements as part of a Capital Improvements Project that helped with flood control in the Mid Higuera Area, an area of repetitive flooding. FEMA also defines Severe Repetitive Loss properties; however, the City does not have any Severe Repetitive Loss properties.

G.5.2 Completed 2014 Mitigation Actions

During the 2019 planning process the City of San Luis Obispo Local Planning Team reviewed all the mitigation actions from the 2014 LHMP. The review indicated the City has completed one mitigation action since 2014 and made continued progress in implementing mitigation projects and building the community's resilience to disasters. Of the 29 mitigation actions identified in the 2014 LHMP, the Planning Team has completed the following action, which the Planning Team notes as being completed in January of 2017:

2.A.12 Add gas pipeline mapping to the City's GIS resources.

G.5.3 Mitigation Actions

The City of San Luis Obispo Local Planning Team identified and prioritized one new mitigation action based on the 2019 risk assessment. New and existing actions were prioritized using the process described in subsection 7.2.1 of the Base Plan. The new mitigation action identifies implementation strategies, the responsible agency, potential funding, estimated cost, and implementation schedule.




Table G.21 City of San Luis Obispo's Mitigation Action Plan

ID	Hazard(s) Mitigated	Description/Background/Benefits	Lead Agency and Partners	Cost Estimate	Potential Funding	Priority	Timeline	Status/ Implementation Notes
SL.1*	Adverse Weather, Biological, Earthquake, Flood, Wildfire, Hazardous Materials	Regularly review and continue to maintain consistency between the Safety Element, Municipal Code, zoning regulations, hazard area maps, and LHMP implementation strategies. Added 10/2016: Review the implementation and impacts of SB1069 Land use zoning	Community Development /Public Works /Fire	Little to no cost	Staff Time/ Dept. Budget	Medium	1-3 years	In progress. Safety Element to be updated in 2021
SL.2	Adverse Weather, Biological, Earthquake, Flood, Wildfire, Hazardous Materials	Train all City employees including fire fighters, police officers, building inspectors, and public works and utilities staff to levels appropriate for their hazard mitigation tasks and responsibilities.	Fire	Little to no cost	Staff Time/ Dept. Budget	Medium	1-3 years	In progress. Currently updating a City-wide training matrix to ensure employees have the valid training based on their position. Once the matrix is complete the City will hold training to ensure all City employees receive appropriate training and certifications. Utilize new Human Capital Management software to ensure new employees receive training during onboarding.
SL.3	Adverse Weather, Earthquake, Flood, Wildfire,	Provide training for City staff who apply its building regulations and planning standards, emphasizing the lessons learned in locations that have experienced disasters	Fire / Community Development /Public Works	Little to no cost	Staff Time/ Dept. Budget	Medium	1 yr.	In progress. Additional modeling has been completed. The results of this modeling indicated that a more expansive model should





ID	Hazard(s) Mitigated	Description/Background/Benefits	Lead Agency and Partners	Cost Estimate	Potential Funding	Priority	Timeline	Status/ Implementation Notes
	Hazardous Materials							be created which is underway.
SL.4	Adverse Weather, Biological, Earthquake, Flood, Wildfire, Hazardous Materials	Conduct disaster-preparedness exercises for the types of hazards discussed in this LHMP.	Fire	Little to no cost	Staff Time/ Dept. Budget	Medium	1 yr.	In progress. Latest Public Point of Distribution drill held at the City of San Luis Obispo was on 10/18/2017. October 2018 Distribution took place on 10/21/18 in Arroyo Grande and Atascadero (the two locations exercised were intended to cover the whole county, including SLO). City plans to continue participating in exercises as allowed.
SL.5	Adverse Weather, Biological, Earthquake, Flood, Wildfire, Hazardous Materials	Establish ongoing Disaster Service Worker training program to include training for City staff to deal with emergencies as well as contribute to risk reduction measures.	Fire	Little to no cost	Staff Time/ Dept. Budget	Medium	1 yr.	In progress
SL.6	Adverse Weather, Biological, Earthquake, Flood, Wildfire,	Review funding opportunities and establish centralized internal procedures to coordinate efforts for securing funds that support risk reduction measures.	Admin. - Finance	Little to no cost	General Funds/ FEMA HMA	High	1 yr.	In progress. Spring of 2019. The City released an RFP to hire a grant writing firm to seek funding opportunities to leverage community





ID	Hazard(s) Mitigated	Description/Background/Benefits	Lead Agency and Partners	Cost Estimate	Potential Funding	Priority	Timeline	Status/ Implementation Notes
	Hazardous Materials							improvement. This includes risk reduction measures.
SL.7	Adverse Weather, Biological, Earthquake, Flood, Wildfire, Hazardous Materials	Identify hazard mitigation projects eligible for grants as part of the Capital Improvement Program planning process.	Public Works/ Utilities	Little to no cost	Cal OES /FEMA: Up to \$2 Million at WRRF	Medium	3-5 years	In progress. The Mid-Higuera Bypass project is currently being designed. Once design is complete, grant application work will begin. Utilities (new) - A \$2 million grant application has been submitted with CalOES for flood proofing mission critical facilities related the Water Resource Recovery Facility.
SL.8	Adverse Weather, Earthquake, Flood, Hazardous Materials	Assess structural capacity of key assets (including bridges) and pursue infrastructure improvements as necessary.	Public Works/ Community Development	Less than \$10,000	General Fund	Medium	3-5 years	In progress. As part of 2019-21 financial plan process the City has reviewed and prioritized assets maintenance and replacement. This prioritized asset list will be presented to the City Council for funding consideration.
SL.9	Adverse Weather, Biological, Earthquake, Flood,	Establish a funded program or mechanism to distribute public information regarding risk reduction activities and projects at City-sponsored events. Identify materials available for use at public education workshops.	Fire	Little to no cost	General Fund	Medium	1-2 years	In progress. Fire Prevention Open House occurred on and 10/14/17 and 10/13/18. Presentations at Cal





ID	Hazard(s) Mitigated	Description/Background/Benefits	Lead Agency and Partners	Cost Estimate	Potential Funding	Priority	Timeline	Status/Implementation Notes
	Wildfire, Hazardous Materials	Coordinate messaging with external agencies such as the American Red Cross and Volunteer Organizations Active in Disasters.						Poly orientations for students and their parents. Department is developing new disaster preparedness neighborhood presentation program and employee disaster worker preparedness beginning FY2020.
SL.10	Adverse Weather, Biological, Earthquake, Flood, Wildfire, Hazardous Materials	Support the efforts and education of people with access and functional needs to prepare for disasters.	Fire	Little to no cost	Staff Time/ Dept. Budget	Medium	1 yr.	In progress
SL.11	Adverse Weather, Biological, Earthquake, Flood, Wildfire, Hazardous Materials	Educate the community on individual preparedness and response to deal with emergencies at times when professional responders would be overwhelmed.	Fire	Little to no cost	General Fund	Medium	1-2 years	In progress. See SL.9 comments
SL.12	Adverse Weather, Biological, Earthquake, Flood, Wildfire,	Offer seminars and/or resources to assist local / small businesses in planning for continuity of operations and emergency preparedness.	Fire	Little to no cost	General Fund	Medium	1-2 years	In progress. Fire department staff attend the weekly meetings at the Downtown Association and has updated a fire safety checklist for festival





ID	Hazard(s) Mitigated	Description/Background/Benefits	Lead Agency and Partners	Cost Estimate	Potential Funding	Priority	Timeline	Status/ Implementation Notes
	Hazardous Materials							vendors in the downtown, provided education to DTA staff.
SL.13*	Adverse Weather, Biological, Earthquake, Flood, Wildfire, Hazardous Materials	Continue to enforce local codes, ordinances, and standards pertaining to safe development and resiliency to natural and human-caused hazards.	Community Development /Fire	Little to no cost	General Funds/ FEMA HMA	High	1-2 years	In progress. As of April of 2019, permits have been issued on all URM structures. All have been finalized/closed out except for four properties, one of which is currently being retrofitted and remodeled (SLO Brew at 736 Higuera). Permits have been issued on two others (1029 and 1035 Chorro) but have not been finalized/closed out in permitting system. Current status on these is currently being researched. Records indicate the last of the four has completed Level A strengthening, but still has an outstanding permit - permit records and status is currently being researched.





ID	Hazard(s) Mitigated	Description/Background/Benefits	Lead Agency and Partners	Cost Estimate	Potential Funding	Priority	Timeline	Status/ Implementation Notes
SL.14	Earthquake	Develop and provide managers of mobile home parks with information on how to improve the seismic performance of mobile homes and awareness of flood risk.	Community Development	Less than \$10,000	Staff Time/ Dept. Budget	Medium	2-3 yrs.	In progress. Still in planning process; will be incorporated into Safety Element)
SL.15	Earthquake, Wildfire, Adverse Weather	The Secure and Resilient Electricity action would plan for energy independence and security at critical facilities throughout the City. By providing grid independent onsite renewable energy, storage, and energy management systems, and by providing a planning and financing framework for future investments, the City will be able maintain uninterrupted operations during times of electricity or natural gas grid instability.	Fire; police; public works; utilities; administration; parks and recreation	\$200k to \$500k;	California Energy Commission; Monterey Bay Community Power	High	3-5 yrs.	New Benefits: A resilient electricity system (solar and storage) at critical facilities ensure ongoing operations during significant disaster events and ensures viability of electric evacuation vehicles, City fleet, and transit vehicles.
SL.16	Earthquake	Continue to implement the Unreinforced Masonry Hazard Mitigation Plan and strengthen buildings identified in Levels A and B.	Community Development / Fire	\$10,000 to \$50,000	General Funds/FEMA HMA	Medium	2-3 yrs.	In progress. See SL.13 comments
SL.17	Flood	Develop and carry out environmentally sensitive flood reduction programs.	Administration - Natural Resources	\$10,000 to \$50,000	FEMA HMA	Medium	2-3 yrs.	In progress. The City continues to assess high priority erosion and sedimentation sites identified in the Waterway Management Plan and provide maintenance or restoration as appropriate; review City owned property and property with drainage easements covering





ID	Hazard(s) Mitigated	Description/Background/Benefits	Lead Agency and Partners	Cost Estimate	Potential Funding	Priority	Timeline	Status/ Implementation Notes
								private properties and conduct vegetation management/removal as needed; and, complete silt removal projects at key drainage locations on a rotating basis. Assess and remove as necessary undesirable trees from creek system with tree/landscape contractors. Natural Resources Program staff manages vegetation trimming or removal to maintain the riparian corridors. The EIR for the Mid-Higuera Bypass project was adopted and the 95% plans are nearing completion.
SL.18	Haz Mat	Continue requiring businesses that use, store, or transport hazardous materials to ensure that adequate measures are taken to protect public health and safety.	Fire	Little to no cost	Certified Unified Program Agency (CUPA)	High	Annual implementation	Fire Department CUPA Participating Agency completes 100% of permitted facility inspections annually to assure compliance with the fire code and state regulations. The fire department is subject to audit by the County





ID	Hazard(s) Mitigated	Description/Background/Benefits	Lead Agency and Partners	Cost Estimate	Potential Funding	Priority	Timeline	Status/ Implementation Notes
								CUPA and has passed all recent audits.
SL.19	Haz Mat	Coordinate with allied agencies to prepare for hazardous materials incidents. Reference City EOP and Training and Exercise Plan; Maintain participation in County hazardous materials team	Fire	Less than \$10,000	Certified Unified Program Agency (CUPA)	Medium	1 yr.	In progress. City Emergency Operations Plan is currently set to be updated. City issued RFP to hire consultant to update plan in Spring of 2019 and is expected to have a completed plan with associated training in Winter of 2020.
SL.20	Haz Mat	Maintain City's web site and other outlets with information regarding the safe handling and disposal of household chemicals.	Fire	Little to no cost	Staff Time/Dept. Budget	Medium	1 yr.	In progress/ongoing
SL.21	Wildfire	Enhance partnerships with CalFire and the local Fire Safe Council for fuel reduction efforts.	Fire	Little to no cost	Cal Fire / FireSafe Grants	Medium	1 yr.	In progress. As of March of 2019, The City of San Luis Obispo is now a recognized focus group and voting board member on the Fire Safe Council
SL.22	Wildfire, Drought	Support ongoing urban forest maintenance and tree trimming programs, to include planting drought-resistant trees and plants.	Public Works - Urban Forestry / Fire / Parks & Recreation / Natural Resources	Less than \$10,000	General Fund	Medium	1-2 yrs.	In progress. Urban Forest Services continues regular maintenance which includes pruning and dead tree removal in City Streets, Parks and other City owned properties.





ID	Hazard(s) Mitigated	Description/Background/Benefits	Lead Agency and Partners	Cost Estimate	Potential Funding	Priority	Timeline	Status/Implementation Notes
SL.23	Wildfire	Continue to conduct current fuel management programs and investigate and apply new and emerging fuel management techniques.	Fire/Natural Resources Director/Parks and Recreation	\$10,000 to \$50,000	FEMA and Fire Safe Council grants	High	1 yr.	In progress. The Natural Resource Manager has taken lead on all fuel management funds and projects in the City Open Space. Additional grant funding has been obtained to augment allocated fuel management budget.
SL.24	Wildfire	Require an enhanced fire protection plan in Local Very High Fire Severity Zones.	Fire	Less than \$10,000	Staff Time/Dept. Budget	Medium	1 yr.	In progress.
SL.25	Biological	Continue offering free flu vaccines to City employees.	Human Resources	Less than \$10,000	County Program	Medium	Annual implementation	In progress. Continued participation in the County Public Health Point of Distribution program.
SL.26	Biological	Educate and encourage City employees to maintain a healthy work environment by utilizing sick and other leave benefits to avoid coming to work when sick or contagious and encouraging employees to develop plans for caring for sick family members taking care of ill family members.	Human Resources	Little to no cost	General Fund	Medium	Annual implementation	In progress. Include in ongoing wellness, benefits, and leave of absence training, education, and general communications.





G.6 Implementation and Maintenance

Moving forward, the City will use the mitigation action table in the previous section to track progress on implementation of each project. As illustrated in the completed actions table (Table G.21) much progress has been made since the plan was originally developed. Implementation of the plan overall is discussed in Section 8 in the Base Plan.

G.6.1 Incorporation into Existing Planning Mechanisms

The information contained within this plan, including results from the Vulnerability Assessment and the Mitigation Strategy, will be used by the City to help inform updates and the development of local plans, programs and policies. The Engineering Division may utilize the hazard information when implementing the City's Community Investment Program and the Planning and Building Divisions may utilize the hazard information when reviewing a site plan or other type of development applications. The City will also incorporate this LHMP into the Safety Element of their General Plan, as recommended by Assembly Bill (AB) 2140. This enables the City of San Luis Obispo to qualify for additional funding through the California Disaster Assistance Act should the State determine there to be a need and/or additional funding to be available.

California State Assembly Bill 162 requires the General Plan Land Use Element to identify existing and proposed uses and flood mitigation strategies within the 100-year floodplain. The HMP should be referenced and used to inform the Land Use Element in order to meet this requirement. California State Senate Bill 1241 requires the Safety Element to incorporate wildfire hazard considerations for State Responsibility Areas (SRAs) and lands within very high fire severity zones. These areas are already depicted within the Safety Element and this Annex. They will be reviewed and updated as appropriate during the future updates to both of these documents. Whenever there are substantive changes to the County HMP or this Annex, those involved in other relevant planning mechanisms in the City will be included in the review process.

As stated in Section 8 of the Base Plan, the HMPC representatives from the City of San Luis Obispo will report on efforts to integrate the hazard mitigation plan into local plans, programs and policies and will report on these efforts at the annual HMPC plan review meeting.

G.6.2 Monitoring, Evaluation and Updating the Plan

The City will follow the procedures to Monitor, review, and update this plan in accordance with San Luis Obispo County as outlined in Section 8 of the Base Plan. The City will continue to involve the public in mitigation, as described in subsection 8.3 of the Base Plan. The Administrative Analyst in the City Fire Department will be responsible for representing the City in the County HMPC, and for coordination with the City LPT, including relevant staff and departments during plan updates. The City realizes it is important to review the plan regularly and update it every five years in accordance with the Disaster Mitigation Act Requirements as well as other State of California requirements. In order to ensure that regular review and update of the HMP occurs, the LPT will convene annually to review and discuss mitigation progress and any new concerns that may benefit from mitigation activities. During each annual review, the LPT will review each goal and objective to evaluate its:

- Relevance to the evolving setting and needs of the City of San Luis Obispo
- Consistency with changes in State and Federal policy
- Relevance to current and expected conditions





The LPT will review the Risk Assessment portion of the plan to determine if the information should be updated or modified. The parties responsible for various implementation should be updated or modified. The parties responsible for various implantation actions will report on:

- Status of their projects
- Implementation processes that have worked well
- Any difficulties encountered
- How coordination efforts are proceeding
- Which strategies should be revised





H.1 District Profile

H.1.1 Mitigation Planning History and 2019 Process

This annex was created during the development of the 2019 San Luis Obispo County Hazard Mitigation Plan Update. The General Manager of the Avila Beach Community Services District was the representative on the County HMPC and took the lead for developing the plan and this annex. The Avila Beach CSD will be responsible for implementation and maintenance of the plan.

Table H.1 Avila Beach CSD Hazard Mitigation Plan Planning Team

Department or Stakeholder	Title
District Management	General Manager

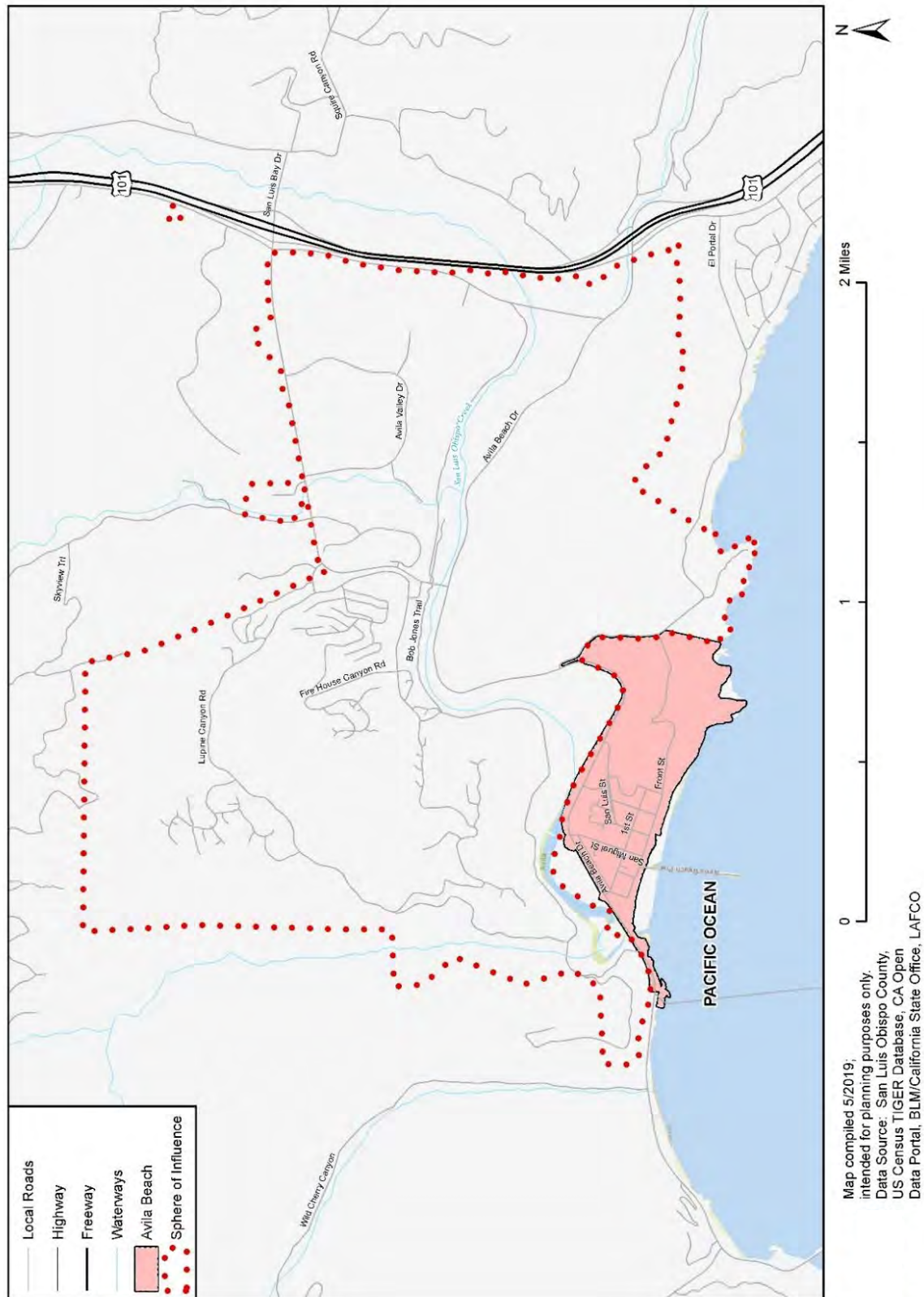
More details on the planning process followed and how the jurisdictions, service districts and stakeholders participated can be found in Section 3 of the Base Plan, as well as how the public was involved during the 2019 update.

Figure H.1 below shows the Avila Beach Community Services District boundaries, represented in pink. The dotted line represents the District's sphere of influence, which corresponds with the Avila Urban Reserve Line.





Figure H.1 Avila Beach Community Services District and Sphere of Influence





H.1.2 District Overview

The Avila Beach Community Services District's (CSD) mission is to provide quality, innovative and cost-effective services that include water, sewer, lighting and fire protection. The District was established in February of 1997 after the Avila Beach County Water District, which provided services such as sanitary and fire protection, and the Avila Lighting District joined together. Today the District encompasses over 150 acres within the County, including all of the Town of Avila Beach.

The Avila Beach CSD is governed by a five-person elected board, each with a four-year term. The Board of Directors is responsible for creating policies for the District and receives recommendations from the District's General Manager and District Counsel. The District's General Manager carries out the policies developed by the Board and serves as the Public Information Officer for the District. The District Engineer is responsible for implementing and developing the engineering plans for all facilities within the District. The Utilities Department provides support to the District operations including Field Crews that handle all sanitary sewer/water emergencies and daily operations. The District's part-time billing clerk is the only District employee, all other management, engineering, operations and maintenance sources are provided through contractors.

In 1976, the Avila Beach County Water District, contracted to purchase water from San Luis Obispo County Service Area #12, which supplies water from the Lopez Reservoir to the District. Currently the Avila Beach Community Services District provides water service to approximately 400 business and residential connections and owns two water storage tanks with the storage capacity of 840,000 gallons and 46 fire hydrants. The Avila Beach CSD is one of five water purveyors in the Avila community area. In addition to County Service Area #12 entitlement from Lopez Lake (68 acre-feet per year AFY), the District is also as sub-contractor to the San Luis Obispo County Flood Control and Water Conservation District Zone 3 and is entitled to 100 AF of "Table A" Water. The CSD added a 100 AF Drought Buffer to their 100 AF Table A allocation in 2017. The District's total water allocation is 168 AF per year.

The Avila Beach CSD provides wastewater collection, treatment and disposal services for the Town of Avila Beach and wastewater treatment and disposal for the Port San Luis Harbor District. The District's wastewater treatment plant was originally built in 1969 by the community of Avila. In the early 1990s the District upgraded the treatment facility to provide secondary treatment and disinfection of wastewater discharged into the Pacific Ocean. The treated municipal wastewater is discharged to the ocean through a 2,240 ft outfall, approximately 1,200 feet beyond the end of the Avila Pier. The District also maintains approximately 10,000 feet of gravity sewer, 40 manholes, 1 lift station, approximately 300 residential sewer connections, 53 commercial/industrial sewer connections, and a wastewater treatment plant serving nearly 1,000 customers and seasonal visitors.

Since 2000, the Avila Beach Community Services District has contracted with Cal Fire/San Luis Obispo County Fire Department to cooperatively provide fire protection services for the Avila community. The Fire Department also works on comprehensive vegetation management planning and stays engaged with the Avila community.

The U.S. Census Bureau estimated the Avila Beach Census Designated Place's (CDP) 2017 population as 1,080, a decrease from 1,166 in 2014. Table H. 2 shows an overview of key social and demographic characteristics of the CDP taken from the U.S. Census Bureau's American Community Survey.



**Table H. 2 Avila Beach CDP Demographic and Social Characteristics, 2014-2017**

Avila Beach CDP	2014	2017	% Change
Population	1,166	1,080	-7.4%
Median Age	58.9	63.1	7.1%
Total Housing Units	989	1,068	8.0%
Housing Occupancy Rate	67.2%	61.8%	-5.4%
% of Housing Units with no Vehicles Available	1.2%	1.4%	0.2%
Median Home Value	\$599,900	\$742,100	23.7%
Unemployment	4.1%	2.3%	-1.8%
Mean Travel Time to Work (minutes)	17.0	27.8	63.5%
Median Household Income	\$73,304	\$100,076	36.5%
Per Capita Income	\$43,153	\$82,202	90.5%
% of Individuals Below Poverty Level	7.4%	4.4%	-3.0%
# of Households	665	660	-0.8%
Average Household Size	1.75	1.64	-6.3%
% of Population Over 25 with High School Diploma	98.6%	100.0%	1.4%
% of Population Over 25 with Bachelor's Degree or Higher	53.6%	36.5%	-17.1%
% with Disability	18.2%	11.9%	-6.3%

Source: U.S. Census Bureau American Community Survey 2014-2017 3-Year Estimates, www.census.gov/

Note: Data is for the Avila Beach Census Designated Place (CDP) which may not have the same boundaries as the Avila Beach Community Service District.

The following table show how the Avila Beach CDP's labor force breaks down by occupation and industry estimates from the U.S. Census Bureau's 2017 American Community Survey.



**Table H. 3 Avila Beach CPD Employment by Industry (2017)**

Industry	# Employed
Population (2017)	1,080
In Labor Force	702
Agriculture, forestry, fishing and hunting, and mining	57
Armed Forces	-
Construction	107
Manufacturing	44
Wholesale trade	70
Retail trade	-
Transportation and warehousing, and utilities	33
Information	-
Finance and insurance, and real estate and rental and leasing	80
Professional, scientific, and management, and administrative and waste management services	77
Educational services, and health care and social assistance	87
Arts, entertainment, and recreation, and accommodation and food services	89
Other services, except public administration	35
Public administration	7
Unemployed	16

Source: U.S. Census Bureau American Community Survey 2012-2017 5-Year Estimates, www.census.gov/

Note: Data is for the Avila Beach Census Designated Place (CDP) which may not have the same boundaries as the Avila Beach Community Service District.

H.1.3 Development Trends

In the late 1990's a significant portion of the Town of Avila Beach was demolished and rebuilt due to significant soil contamination from an oil spill by the Unocal Corporation (Unocal), who was also responsible for the clean-up operations. The rebuilding effort was guided by the Avila Beach Specific Plan, which included the Avila Beach Community Services District. The planning process allowed the Town and the CSD to redesign their community while keeping the Town's eclectic flair. The land uses within the boundaries of the District include commercial retail, residential multi-family, industrial, recreation and residential single-family. According to the Avila Community Plan, approximately 17 percent of the housing units within the Town of Avila Beach are permitted vacation rentals (Avila Community Plan, 2018). Figure H.2 below depicts the location and amount of the vacation homes, represented in purple.

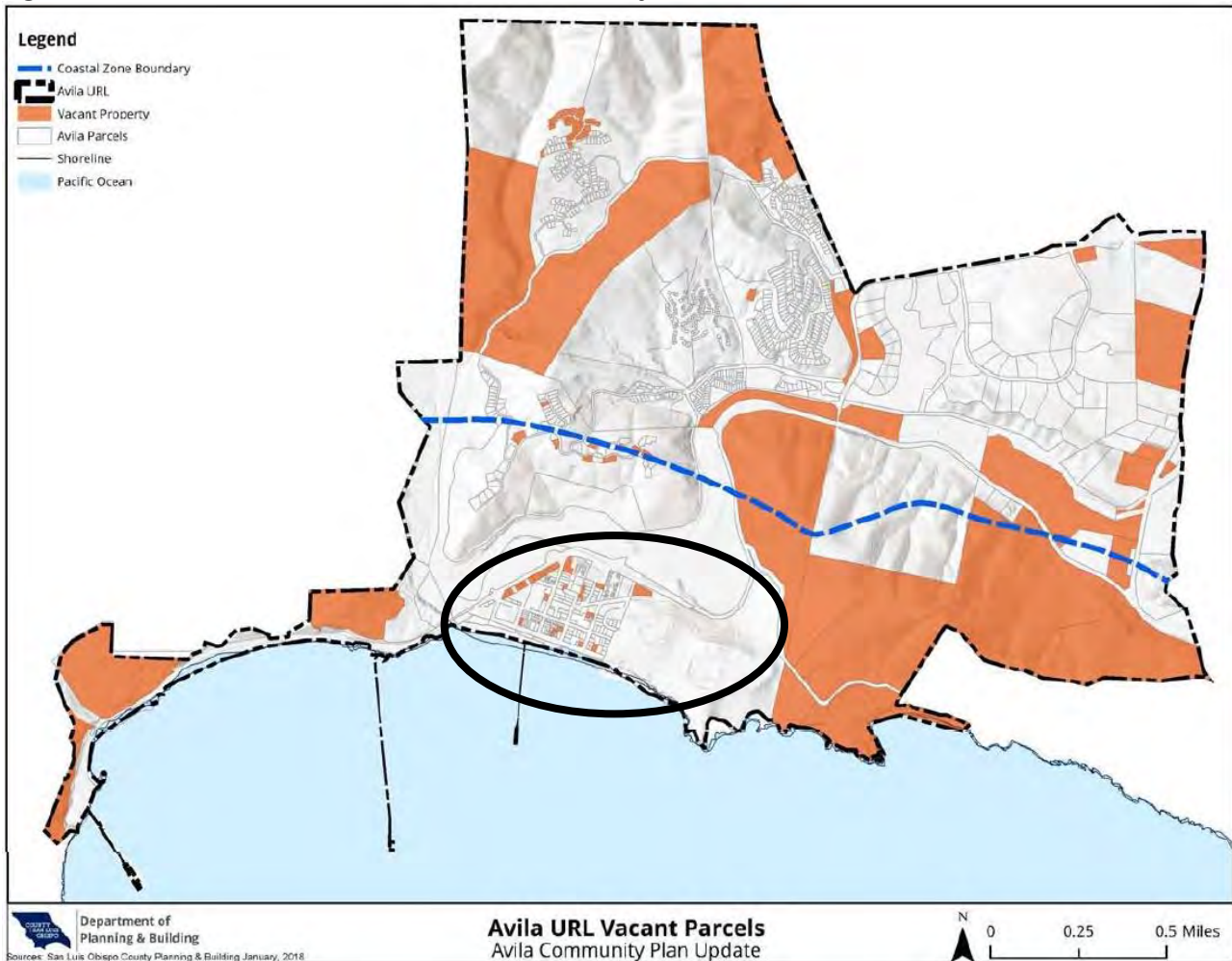


**Figure H.2 Town of Avila Beach Vacation Rental Permits**

Source: Avila Community Plan, Background Report, August 2018

There is opportunity for future development to occur within the Avila Beach CSD boundaries with several vacant parcels located throughout the Town of Avila Beach; refer to Figure H.3 below. Future development of any of these vacant parcels and re-development of existing underutilized parcels will need to follow the standards and regulations set forth in the County Coastal Zone Framework and the Avila Beach Specific Plan. Future development will need to be coordinated with the Avila Beach Community Services District to ensure safe and efficient wastewater services and adequate water supply is available and not have an impact on existing users.

Figure H.3 Vacant Parcels in the Avila Community



Source: Avila Community Plan, Background Report, August 2018 *The black oval is a representation of the Avila Beach CSD boundaries and the vacant parcels within the Town of Avila Beach.

H.1.4 Other Community Planning Efforts

Coordination and synchronization with other community planning mechanisms and efforts are vital to the success of this plan. To have a thorough evaluation of hazard mitigation practices already in place, appropriate planning procedures should also involve identifying and reviewing existing plans, policies, regulations, codes, tools, and other actions are designed to reduce a community's risk and vulnerability from natural hazards.

As an unincorporated community Avila and the Avila Beach CSD are referenced in other County planning documents and regulated by County policies and planning mechanisms. Integrating existing planning efforts, mitigation policies, and action strategies into this annex establishes a credible, comprehensive document that weaves the common threads of a community's values together. The development of this jurisdictional annex involved a comprehensive review of existing plans, studies, reports, and initiatives from San Luis Obispo County and the Avila community that relate to hazards or hazard mitigation. A high-level summary of the key plans, studies and reports is summarized in the table below. Information on how they informed the update are noted and incorporated where applicable.



In addition to the development standards within the Avila Beach Specific Plan, there are County planning mechanisms that regulate future and existing development within the Avila Beach CSD planning area. Refer to H.4 Capability Assessment for more information on the plans, policies, regulations and staff that govern the Avila Beach CSD.

Table H.4 Summary of Review of Key Plans, Studies and Reports

Plan, Study, Report Name	How Document Informed the Annex
Avila Community Plan, Background Report (2018)	Incorporated background information on the community and CSD including historical and cultural resources, and development and land use trends; Incorporated hazard information and maps (if applicable) and informed the Vulnerability Assessment.
Avila Beach Specific Plan (2001)	Informed history of the Town of Avila Beach, including the Unocal Cleanup efforts; Incorporated information on historical resources
Avila Beach Community Services District Sewer System Management Plan (Revised April 2014)	Incorporated information into the District overview
San Luis Bay Area Plan – Coastal (Revised August 2009)	Incorporated hazard information related to flooding,
County of San Luis Obispo Local Hazard Mitigation Plan (2014)	Informed past hazard event history.
County of San Luis Obispo Safety Element (1999)	Informed past hazard event history and general background information on the planning area
San Luis Obispo County – Tsunami Emergency Response Plan (Revised April 2016)	Informed the Vulnerability Assessment for Tsunami risk
San Luis Obispo County – Community Wildfire Protection Plan (March 2019)	Informed the Vulnerability Assessment for Wildfire risk

H.2 Hazard Identification and Summary

The Avila Beach CSD planning team identified the hazards that affect the District and summarized their frequency of occurrence, spatial extent, potential magnitude, and significance specific to the Avila Beach CSD (see Table H.5). There are no hazards that are unique to Avila Beach.





Table H.5 Avila Beach CSD Hazard Risk Summary

Hazard	Geographic Area	Probability of Future Occurrence	Magnitude/Severity (Extent)	Overall Significance
Coastal Storm/Coastal Erosion/Sea Level Rise	Significant	Likely	Limited	Medium
Drought and Water Shortage	Extensive	Likely	Critical	High
Earthquake	Extensive	Unlikely	Critical	Medium
Flood	Significant	Highly Likely	Limited	Medium
Landslides and Debris Flow	Significant	Occasional	Limited	Medium
Tsunami and Seiche	Significant	Occasional	Critical	Medium
Wildfire	Significant	Likely	Limited	High
Human Caused: Hazardous Materials	Significant	Highly Likely	Negligible	Medium
Geographic Area Limited: Less than 10% of planning area Significant: 10-50% of planning area Extensive: 50-100% of planning area Probability of Future Occurrences Highly Likely: Near 100% chance of occurrence in next year or happens every year. Likely: Between 10 and 100% chance of occurrence in next year or has a recurrence interval of 10 years or less. Occasional: Between 1 and 10% chance of occurrence in the next year or has a recurrence interval of 11 to 100 years. Unlikely: Less than 1% chance of occurrence in next 100 years or has a recurrence interval of greater than every 100 years.		Magnitude/Severity (Extent) Catastrophic—More than 50 percent of property severely damaged; shutdown of facilities for more than 30 days; and/or multiple deaths Critical—25-50 percent of property severely damaged; shutdown of facilities for at least two weeks; and/or injuries and/or illnesses result in permanent disability Limited—10-25 percent of property severely damaged; shutdown of facilities for more than a week; and/or injuries/illnesses treatable do not result in permanent disability Negligible—Less than 10 percent of property severely damaged, shutdown of facilities and services for less than 24 hours; and/or injuries/illnesses treatable with first aid Significance Low: minimal potential impact Medium: moderate potential impact High: widespread potential impact		

H.3 Vulnerability Assessment

The intent of this section is to assess the Avila Beach Community Services District’s vulnerability separate from that of the planning area, which has already been assessed in Section 5 Hazard Identification and Risk Assessment in the Base Plan. This vulnerability assessment analyzes the population, property, and other assets at risk to hazards ranked of medium or high significance that may vary from other parts of the planning area.

The information to support the hazard identification and risk assessment for this Annex was collected through a Data Collection Guide, which was distributed to each participating municipality or special district to complete during the planning process. Information collected was analyzed and summarized in order to identify and rank all the hazards that could impact anywhere within the County, as well as to rank the hazards and identify the





related vulnerabilities unique to each jurisdiction. In addition, the Avila Beach CSD planning team members were asked to share information on past hazard events that have affected the Community Services District.

Each participating jurisdiction was in support of the main hazard summary identified in the Base Plan (see Table 5.2). However, the hazard summary rankings for each jurisdictional annex may vary slightly due to specific hazard risk and vulnerabilities unique to that jurisdiction (see Table H.5 below). Identifying these differences helps differentiate the jurisdiction's risk and vulnerabilities from that of the overall County.

Note: The hazard "Significance" reflects overall ranking for each hazard and is based on the Avila Beach CSD planning team input from the Data Collection Guide and the risk assessment developed during the planning process (see Section 5 of the Base Plan), which included a more detailed qualitative analysis with best available data.

The hazard summaries in Table H.5 reflect the hazards that could potentially affect the District. Based on this analysis, the priority hazard (High Significance) for mitigation are wildfire and drought. The discussion of vulnerability for each of the following hazards is in subsection H.3.2 Estimating Potential Losses. Those of Medium or High significance for the Avila Beach CSD are identified below.

- Drought and Water Shortage
- Earthquake
- Flood
- Landslides and Debris Flow
- Coastal Storm/coastal Erosion/Sea Level Rise
- Tsunami
- Wildfire
- Human Caused: Hazardous Materials

Other Hazards

Hazards assigned a Significance rating of Low and which do not differ significantly from the County ranking (e.g., Low vs. High) are not addressed further in this plan and are not assessed individually for specific vulnerabilities in this section. In the Avila Beach Community Services District, subsidence, high wind/tornado and extreme heat, are the only hazard ranked as a low significance to Avila Beach.

Additionally, the CSD's Committee members decided to rate several hazards as Not Applicable (N/A) to the planning area due to a lack of exposure, vulnerability, and no probability of occurrence. The following hazards are considered Not Applicable (N/A) to the Avila Beach Community Services District.

- Agricultural Pest Infestation and Disease
- Biological Agents (naturally occurring)
- Dam Incidents
- Subsidence

H.3.1 Assets at Risk

This section considers the District's assets at risk, including values at risk, critical facilities and infrastructure, historic assets, economic assets, and growth and development trends.

Values at Risk

The following data on property exposure is derived from the San Luis Obispo County 2017 Parcel and Assessor data. This data should only be used as a guideline to overall values in the Community Services District as the information has some limitations. The most significant limitation is created by Proposition 13. Instead of





adjusting property values annually, the values are not adjusted or assessed at fair market value until a property transfer occurs. As a result, overall value information is likely low and does not reflect current market value of properties. It is also important to note that in the event of a disaster, it is generally the value of the infrastructure or improvements to the land that is of concern or at risk. Generally, the land itself is not a loss. Table H.6 shows the exposure of properties (e.g., the values at risk) broken down by property type for the Avila Beach Community Services District.

Table H.6 2019 Property Exposure for the Avila Beach CSD by Property Types

Property Type	Property Count	Improved Value	Content Value	Total Value
Commercial	15	\$7,203,045	\$7,203,045	\$14,406,090
Government/Utilities	17	\$61,794	--	\$61,794
Other/Exempt/Misc.	26	\$10,502,046	--	\$10,502,046
Residential	63	\$19,318,643	\$9,659,322	\$28,977,965
Multi-Family Residential	86	\$29,723,864	\$14,861,932	\$44,585,796
Residential: Other	14	\$26,132,720	\$13,066,360	\$39,199,080
Vacant	19	\$5,879,402	--	\$5,879,402
Total	240	\$98,821,514	\$44,790,659	\$143,612,173

Source: Wood Plc analysis based on ParcelQuest and San Luis Obispo County Assessor's Office data 2019

Critical Facilities and Infrastructure

A critical facility may be defined as one that is essential in providing utility or direction either during the response to an emergency or during the recovery operation. See Section 5 of the Base Plan for more details on the definitions and categories of critical facilities.

An inventory of critical facilities in the Avila Beach planning area from San Luis Obispo County GIS is provided in Table H.7 and illustrated in Figure H.4.

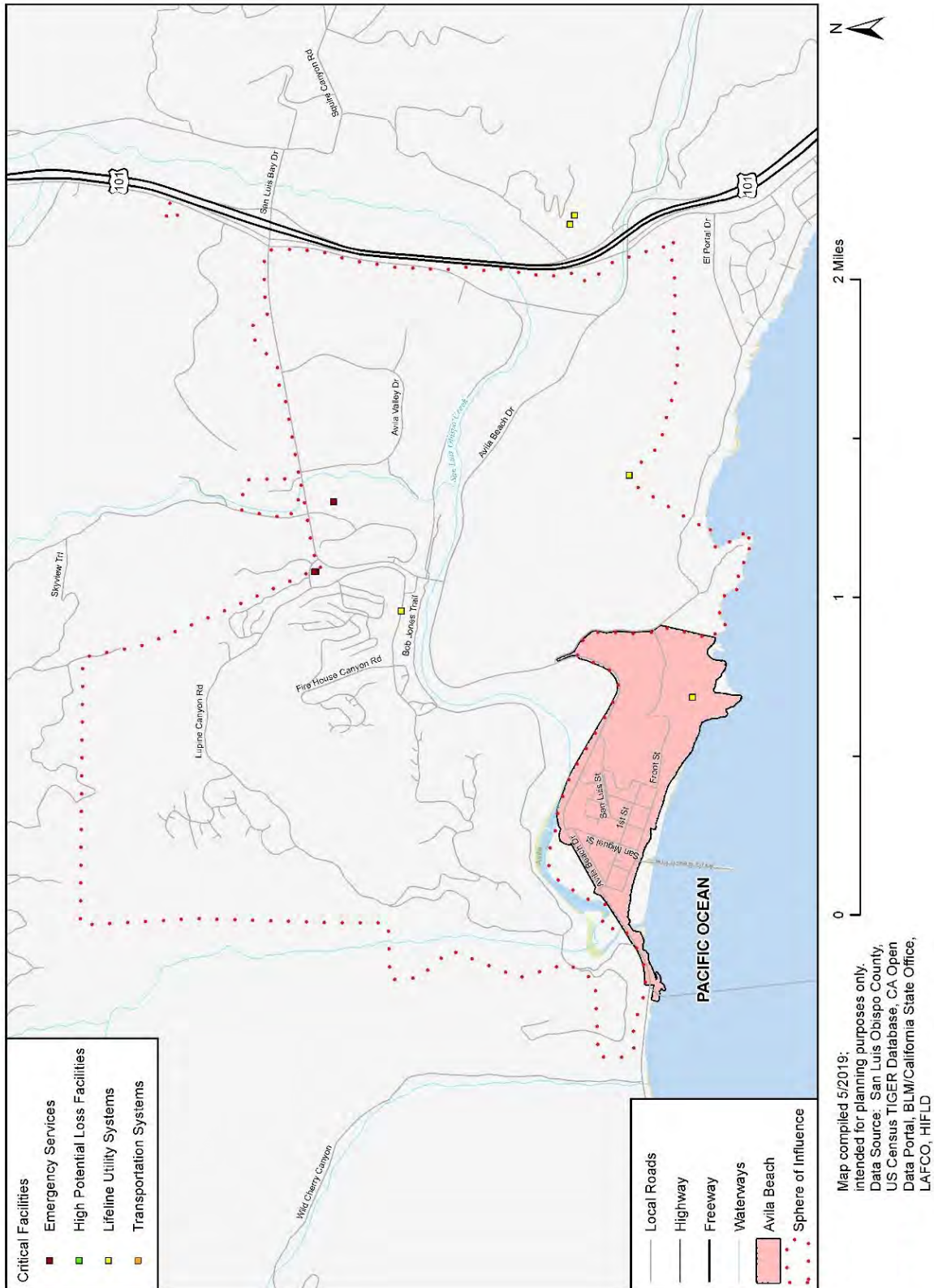
Table H.7 Avila Beach CSD's Critical Facilities

Facility Type	Counts
FM Transmission Towers	1
Total	1

Source: San Luis Obispo County Planning & Building, HIFLD 2017



Figure H.4 Avila Beach CSD Critical Facilities





Essential Facilities

Essential facilities as identified by the Avila Beach CSD Planning Team are as follows:

- Wastewater Treatment Plan - \$15 million replacement value
- Water Storage and Distribution - \$2 million replacement value

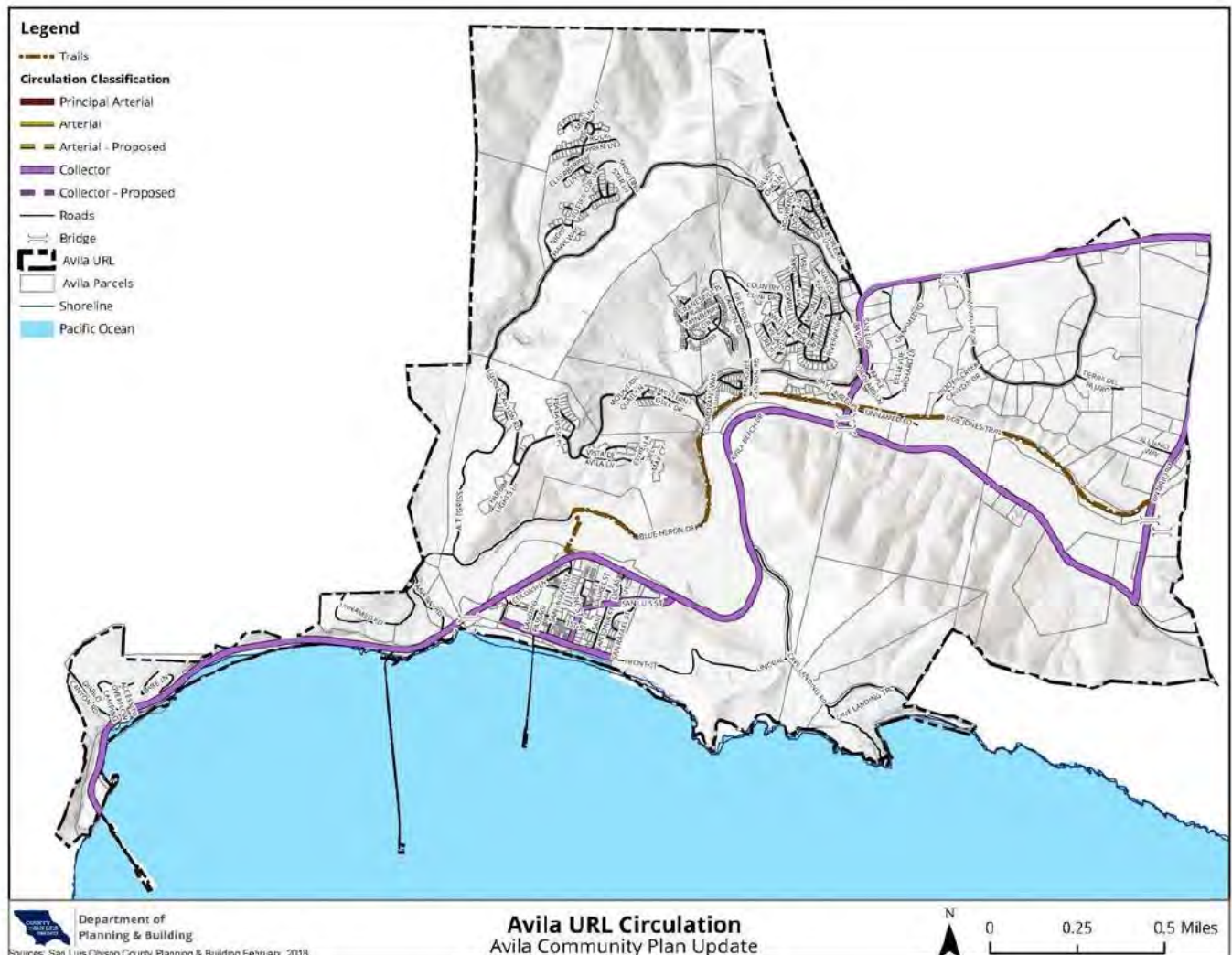
Transportation and Lifeline Facilities

According to the GIS analysis there is one lifeline utility system, a FM Transmission Tower, located in the Avila Beach CSD jurisdiction.

Highway 101 from San Luis Bay and Avila Beach Drive area is the only way to access the Avila Beach planning area. There is no secondary access into or out of the community. According to the Avila Beach Community Plan (2018) traffic through Avila is made of three main users: PG&E employment, recreation use and residential use. Avila Beach Drive serves as the main access point to the Diablo Canyon Power Plant. The County of San Luis Obispo Public Works Department recently completed a seismic retrofit of the Avila Beach Drive Bridge, the only method of accessing Port San Luis, and the Diablo Canyon Power Plant. The following figure from the Avila Beach Community Plan shows transportation facilities in the Avila Beach area.



Figure H.5 Avila Beach Circulation Map



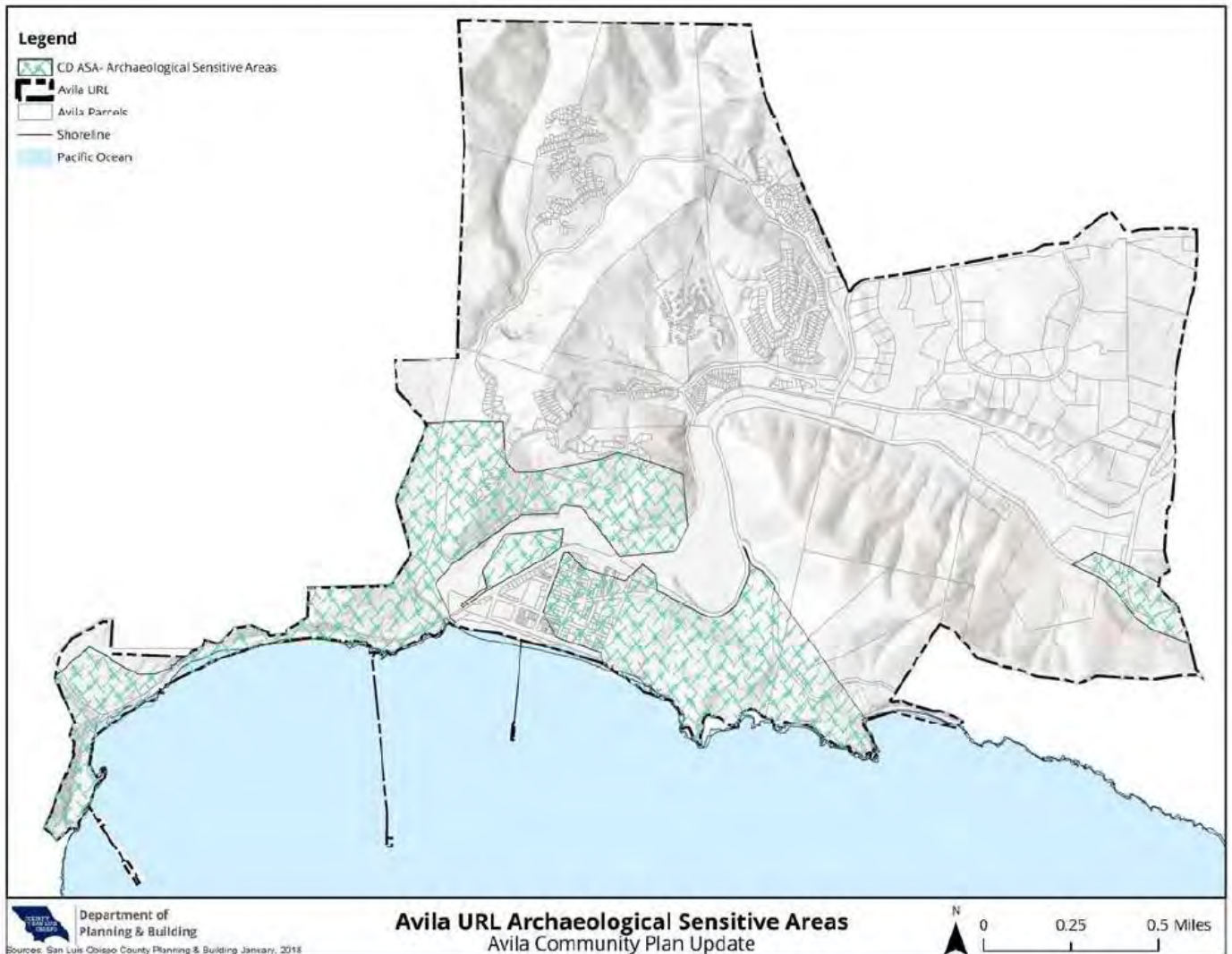
Source: Avila Community Plan, Background Report, August 2018

Historic and Cultural Resources

The Avila Beach Specific Plan notes four structures of historical significance within the Town of Avila Beach, these structures include: The Custom House, The Sea Barn, The Yacht Club and Avila Grocery. All of these historic structures were removed, replaced and restored in their original locations after the Unocal cleanup process.

The Town of Avila Beach is also the former home of the Chumash Indian Community (Avila Community Plan, Background Report 2018). Due to this historic and archaeological connection, the Town of Avila Beach and much of the land within boundaries of the District, are designated by the County as archeologically sensitive areas. To develop within an archeologically sensitive area in the County, a landowner is required to hire a qualified archaeologist with knowledge of local Native American culture to perform a preliminary site survey that must be approved by the County Environmental Coordinator. Figure H.6 below from the 2018 Avila Community Plan Background Report depicts the Archaeologically Sensitive Areas within the Avila community as defined by the combining designation in the County's Coastal Zone Land Use Ordinance.

Figure H.6 Archaeologically Sensitive Areas



Source: Avila Community Plan, Background Report, August 2018

Natural Resources

Natural resources are important to include in benefit-cost analyses for future projects and may be used to leverage additional funding for projects that also contribute to community goals for protecting sensitive natural resources. Awareness of natural assets can lead to opportunities for meeting multiple objectives. For instance, protecting wetlands areas protects sensitive habitat as well as attenuates and stores floodwaters. The San Luis Bay Area Plan (Coastal) (2009) designated the following combining designations that apply to the protection of special resources in the Avila Beach community:

- Ontario Ridge (SRA) – The major ridge forms an important scenic backdrop for the coastal areas of Avila Beach and Pismo Beach, as well as for Avila Valley. Open space agreements on the slopes should be obtained at the time of development proposals.
- San Luis Creek Estuary (SRA) – This small estuary west of the community of Avila beach is an important feeding and resting area for migratory waterfowl. San Luis Creek may be the southernmost stream



supporting steelhead rainbow trout runs in the State [Note, steelhead rainbow trout were designated as a Threatened Species in 2006]

- San Luis Obispo Creek (FH) – Drainage course should be maintained in their natural state and native vegetation and habitats retained.

Economic Assets

Tourism is the largest economic driver for the Avila Beach community. According to the Avila Community Plan (2018), the top employment sectors in Avila are primarily “visitor-serving” and include the following sectors: educational services, accommodation and food services, arts and entertainment, and recreation sectors.

H.3.2 Estimating Potential Losses

This section details vulnerability to specific hazards of high or medium significance, where quantifiable, and/or where (according to LPT member input) it differs from that of the County overall.

Table H.6 above shows Avila Beach’s exposure to hazards in terms of number and value of structures. San Luis Obispo County’s parcel and assessor data was used to calculate the improved value of parcels. The most vulnerable structures are those in the floodplain (especially those that have been flooded in the past), unreinforced masonry buildings, and buildings built prior to the introduction of modern-day building codes. Impacts of past events and vulnerability to specific hazards are further discussed below (see Section 5 of the Base Plan.)

Drought and Water Shortage

Since the Spanish began settling the area of what is today the Avila Community, drought has posed a risk to those living there. In 1842 Miguel Avila was granted the Rancho San Miguelito where he raised cattle and grew grain. After a significant drought event between 1863-64 decimated Avila’s cattle, he was forced to sell his home and portions of his shoreline property west of the present Town of Avila Beach. In present day, drought and water shortages continue to pose a risk to the Avila community and the services provided by the Avila Beach Community Services District.

The primary sources of water supply for the Avila Beach CSD are surface water sources from the Lopez Lake Reservoir and the State Water Project. The Avila Beach CSD has a total entitlement of 168 acre-feet per year of water allocations; 68 acre-feet per year (AFY) from the Lopez Lake Reservoir and 100 AFY from the State Water Project along with a 100 AFY Drought Buffer. The District typically uses approximately 80 AFY and anticipates build-out demand will be approximately 125 AFY. The State Water Project is a major source of water for all the Central Coast, but it is also considered a supplementary source of water due to hydrologic variability, maintenance and repair requirements that can cause reduced deliveries or a complete shutdown of the delivery system. According to the Avila Community Plan, recent drought events in conjunction with pumping restrictions in consideration of endangered species habitat lowered the 50-100 percent contracted allocations for the Central Coast to 35 percent in 2008 and 40 percent in 2009. The following figure from the Avila Community Plan, shows the existing and forecasted water supply and demand for the five water purveyors within the Avila Community as was described in the County 2014-2016 Resource Management Report.



**Figure H.7 Avila Urban Reserve Line Existing and Forecasted Water Supply and Demand**

Demand	Avila Beach CSD	Avila Valley MWC	San Miguelito MWC	CSA 12	Port San Luis
FY 2015/2016 Demand (AFY)	74.7 ¹	27.6 ¹	125.5 ¹	68 ²	35
Forecast Demand in 15 Years (AFY)	143	31	359	67	35
Forecast Demand in 20 Years (AFY)	166	31	383	66	67
Buildout Demand (30 Or More Years) (AFY)	162-170 ³	30-32 ³	373-393 ³	65-68 ³	67-69 ³
Supply					
State Water Project ⁴	66 ⁵	20	275	7 ⁶	0
Lopez Lake Reservoir	68	12	0	61	100
Avila Valley Sub-Basin	0	20	118	Uncertain ⁷	0
Total Supply:	134	52	393	68	100
Water Supply Versus Forecast Demand	Water demand projected over 20 years will not equal or exceed the estimated dependable supply. This is due primarily to a lack of information regarding the safe yield of the sub-basin.				
Notes:					
1. See Table II-1. Current year data for agriculture and rural are from 2012.					
2. 2011 data.					
3. The low end of the forecast demand range assumes 5% additional conservation (beyond what has already been accomplished) at buildout for all urban users.					
4. State Water Project average allocation assumes 66 percent of contract water service amount.					
5. Avila Beach CSD has a 100 AFY allocation from the State Water Project, but no drought buffer. Therefore, the 66 percent assumption for State Water Project delivery is 66 AFY.					
6. Seven (7) AFY of SWP water allocated to the San Luis Coastal Unified School District.					
7. Individual water users within CSA 12 boundary could request an exemption to install a private well and pump water from the Avila Valley Sub-basin. It is unknown the number of users with private wells, but it is likely minimal.					

Source: Avila Community Plan, Background Report, August 2018

Drought impacts are wide-reaching and may be economic, environmental, and/or societal. The most significant impacts associated with drought in the planning area are those related to water intensive activities such as wildfire protection, jurisdictional usage, commerce, tourism and recreation. During past drought events in the planning area, water restrictions have been imposed. Drought conditions can also cause soil to compact and not absorb water well, potentially making an area more susceptible to flooding.

Earthquake

According to the Avila Community Plan, there are two fault lines that run through the southern portion of the Avila Community, neither of which are considered active. As a coastal community, there is also a risk of earthquakes offshore and resulting tsunami events (refer to the Tsunami Section below). In 1916 a magnitude 5.1 earthquake occurred offshore of Avila Beach in the San Luis Bay. There is limited data on the event such as if ground shaking was felt and at what intensity. The earthquake reportedly caused smokestacks at the Port San Luis Union Oil Refinery to fall and created a landslide that blocked railroad tracks.

The Diablo Canyon Power Plant is located just north of Avila Beach and is within the proximity of the Hosgri fault line just offshore. The Power Plant was originally designed to withstand a 6.75 magnitude earthquake and has



been upgraded to withstand a 7.5 magnitude earthquake. The Power Plant has in place extensive seismic monitoring and safety systems to shut down quickly in a significant ground shaking event. Refer to: Hazardous Materials below for more information related to the Diablo Canyon Power Plant.

As a coastal community, liquefaction – the result of ground shaking causing fine grained, saturate soils to liquefy and act as a fluid – poses a risk to the Avila Beach CSD. Table H.8 shows the types of properties at moderate risk of liquefaction. Based on this analysis there are 141 properties at moderate risk of liquefaction with a total value of over \$93 million. Residential properties are the most vulnerable property type to liquefaction in Avila Beach, with a combined total of 76 properties located in an area of moderate liquefaction risk and a total value of over \$63 million.

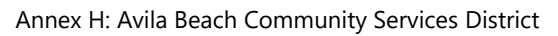
Table H.8 Property Types with Moderate Liquefaction Risk

Property Type	Property Count	Improved Value	Content Value	Total Value
Commercial	15	\$7,203,045	\$7,203,045	\$14,406,090
Government/Utilities	14	\$61,794	--	\$61,794
Other/Exempt/Misc.	19	\$9,900,305	--	\$9,900,305
Residential	18	\$6,204,245	\$3,102,123	\$9,306,368
Multi-Family Residential	47	\$14,143,207	\$7,071,604	\$21,214,811
Residential: Other	11	\$22,050,689	\$11,025,345	\$33,076,034
Vacant	17	\$5,820,835	--	\$5,820,835
Total	141	\$65,384,120	\$28,402,116	\$93,786,236

Source: San Luis Obispo County Planning and Building Dept., Assessor's Office, ParcelQuest, Wood Plc Parcel Analysis

The following map depicts the areas of the Avila Community that is at risk of liquefaction. The western portion of the Avila Beach CSD boundary along Avila Beach Drive, the coastline, and areas along the creeks, are designated as areas of moderate potential for liquefaction.





Liquefaction Risk

- High Risk
- Moderate Risk
- Low Risk

Local Roads

Highway

Freeway

Waterways

Avila Beach

Sphere of Influence

Map compiled 5/2019;
intended for planning purposes only.
Data Source: San Luis Obispo County
US Census TIGER Database, CA Open

Map compiled 5/2019;
intended for planning purposes only.
Data Source: San Luis Obispo County,
US Census TIGER Database, CA Open
Data Portal, BLM/California State Office, LAFCO



Flood

The Avila Beach community is at risk of both coastal and riverine flooding. The San Luis Obispo Creek, which is 18 miles long and ends at Avila Beach draining into the Pacific Ocean, poses the greatest risk of flooding. The areas adjacent to the Creek have the Combining Designation of a Flood Hazard (FH) and must meet the County standards set forth in Title 23 and the San Luis Bay Coastal Area Plan (Area Plan). According to the Area Plan in the event of a 100-year flood event major flooding will occur throughout the length of the San Luis Obispo Creek. The flooding within the Creek caused significant flood damage in 1969 and 1973. Due to the risk of flooding along the Creek, the Area Plan recommends designating open space land uses adjacent to the floodplain. Road infrastructure is most at risk of being damaged during a flood event in the planning area. The Avila Community Plan lists the following transportation infrastructure where flooding occurs often:

- Avila Beach Drive
- San Luis Bay Drive
- Ontario Road
- Parking Lot in Avila Beach (*Port of San Luis jurisdiction*)
- Intersection of First Street and San Francisco Street

All of the infrastructure listed above suffer from occasional flooding, but the parking lot is reported to flood consistently during the rainy season (January-March). In 2016, the San Luis Obispo County Public Works Department spent \$60,000 pumping water out of the parking lot. The Department created a Conceptual Design Report in 2017 that evaluated three alternatives to address the flooding issue. The final recommendation from the report was for the installation of a permanent pumping system (estimated cost of \$375,000) with projected operations and maintenance cost of approximately \$25,000 annually. The 2017-2018 County Capital Improvement Program (CIP) report identified a long-term flood control project (beyond the 5-year CIP timeframe) that will include a pumping system for the parking lot culvert outfall to mitigate the flooding issue.

Avila Beach does not participate separately in the National Flood Insurance Program (NFIP) but will continue to support the County's participation in and compliance with the NFIP.

Values at Risk

A flood vulnerability assessment was completed during the 2019 update, following the methodology described in Section 5 of the Base Plan. Table H.9 and Table H.10 summarize the values at risk in the City's 100-year and 500-year floodplain, respectively. These tables also detail loss estimates for each flood.

Table H.9 Avila Beach CSD's FEMA 1% Annual Chance Flood Hazard by Property Type

Property Type	Property Count	Improved Value	Content Value	Total Value	Loss Estimate
Government/Utilities	5	--	--	\$0	\$0
Total	5	\$0	\$0	\$0	\$0

Source: San Luis Obispo County Planning and Building Dept., Assessor's Office, ParcelQuest, Wood Plc Parcel Analysis

**Table H.10 Avila Beach CSD's FEMA 0.2% Annual Chance Flood Hazard by Property Type**

Property Type	Property Count	Improved Value	Content Value	Total Value	Loss Estimate
Commercial	11	\$5,895,667	\$5,895,667	\$11,791,334	\$2,947,834
Government/Utilities	5	\$61,794	--	\$61,794	\$15,449
Other/Exempt/Misc.	15	\$7,605,508	--	\$7,605,508	\$1,901,377
Residential	16	\$5,414,520	\$2,707,260	\$8,121,780	\$2,030,445
Multi-Family Residential	20	\$5,499,258	\$2,749,629	\$8,248,887	\$2,062,222
Residential: Other	11	\$22,050,689	\$11,025,345	\$33,076,034	\$8,269,008
Vacant	17	\$5,820,835	--	\$5,820,835	\$1,455,209
Total	95	\$52,348,271	\$22,377,901	\$74,726,172	\$18,681,543

Source: San Luis Obispo County Planning and Building Dept., Assessor's Office, ParcelQuest, Wood Plc Parcel Analysis

Based on this analysis, the Avila Beach CSD has significant assets at risk of flooding in a 500-year storm. Five (5) improved parcels are located within the 100-year floodplain that are classified as government or utilities properties. An additional ninety-five (95) improved parcels valued at over \$74 million fall within the 500-year floodplain.

Applying the 25 percent damage factor as previously described in Section 5 there is a 0.2 percent chance in any given year of a 500-year flood causing roughly \$75 million in damage (combined damage from both floods). Limitations: This model may include structures in the floodplains that are elevated at or above the level of the base-flood elevation, which will likely mitigate flood damage. Also, the assessed values are well below the actual market values. Thus, the actual value of assets at risk may be significantly higher than those included herein.

Critical Facilities at Risk

Based on GIS analysis there are no critical facilities located in the 100-year or 500-year flood zone.

Landslides and Debris Flow

Most of the Avila community is at moderate to very high potential for a landslide event to occur. As shown in Figure H.9 below, the risk of landslides is concentrated on the eastern portion of the Avila Beach CSD limits. The land uses at moderate to high risk of a landslide event include residential multi-family, the only industrial lot in the community, where the former Union Oil Company tank farm is located as well as the only single-family homes in the jurisdiction, are at moderate to high risk of a landslide event.

Table H.11 Avila Beach CSD's Moderate Landslide Risk by Property Type

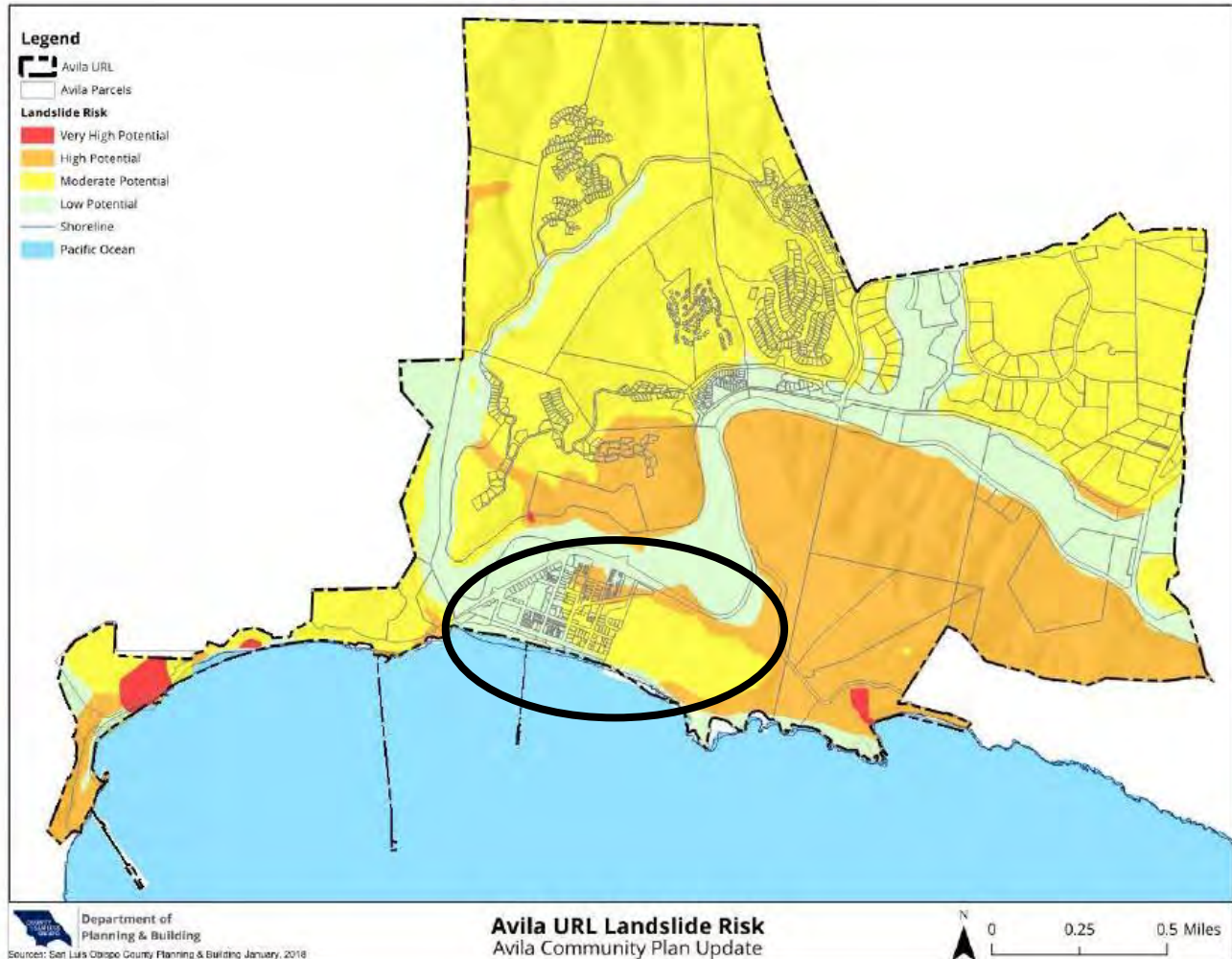
Property Type	Property Count	Improved Value	Content Value	Total Value
Multi-Family Residential	8	\$3,144,278	\$1,572,139	\$4,716,417
Other/Exempt/Misc.	2	--	--	\$0
Residential	15	\$4,037,041	\$2,018,521	\$6,055,562
Total	25	\$7,181,319	\$3,590,660	\$10,771,979

Source: San Luis Obispo County Planning and Building Dept., Assessor's Office, ParcelQuest, Wood Plc Parcel Analysis

A landslide event along Avila Beach Drive, the only major road into or out of the Town of Avila Beach, could have serious impacts on both visitors and residents as well as impact travel to and from the Port of San Luis and the

Diablo Canyon Power Plant. According to the LPT a massive landslide event that occurred 10 years ago along Avila Beach Drive did cut off access to the Port and Diablo Canyon. The committee noted there is an alternative entrance through Diablo Canyon, but it not designed for hundreds of vehicles passing through for the extended period of time that would be necessary to clean the debris from the roadway caused by the landslide event.

Figure H.9 Avila Beach CSD Landslide Risk



Source: Avila Community Plan, Background Report, August 2018 *The black oval is a representation of the Avila Beach CSD boundaries

Coastal Storm/Coastal Erosion/Sea Level Rise

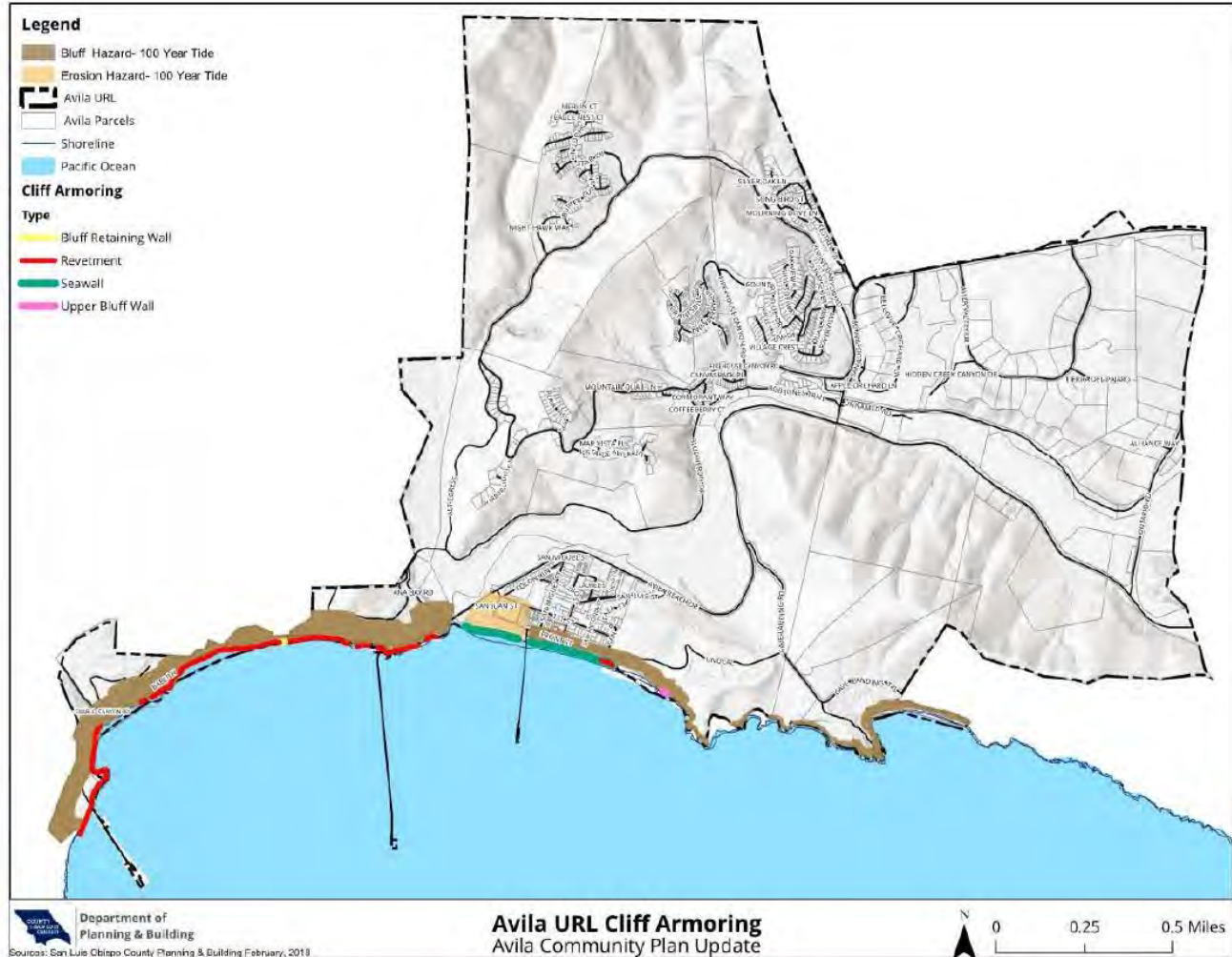
As a low-lying coastal community Avila Beach is exposed to a range of coastal hazards, including coastal storms and coastal erosion. As described in the Base Plan (refer to Section 5), these hazards are projected to become more severe when combined with sea level rise. The Avila Beach community has dealt with the aftermath of coastal storms. A coastal storm in March 1983 caused severe damage to the Union Oil Pier. Refer to the Base Plan for more information including pictures of the damage to the pier from the 1983 storm, as well as the Hazard Potential of Jurisdictions and Urban Areas with the San Luis Obispo Coast Table for analysis specific to the Avila community.

The Avila coast is considered to be at moderate risk of coastal damage from storm waves. This has been mitigated slightly through coastal armoring including a series of bluff and sea walls between Front Street and



shoreline. Because of this armoring it is expected the community will experience lesser impacts of bluff erosion compared to other coastal communities. The following figures depict the areas within the Avila Community that are at risk of coastal erosion and areas where coastal armoring is in place.

Figure H.10 Areas at Risk of Coastal and Bluff Erosion and Coastal Armoring



Source: Avila Community Plan, Background Report, August 2018

Rising sea level as a result of climate change is projected to increase the intensity of coastal storms, flooding, inundation and erosion along the Avila coast. The areas with the highest potential of experiencing coastal hazards include the shoreline, cliffs and low-lying areas adjacent to the San Luis Obispo Creek which are vulnerable to flooding without the rising sea levels. The following figure shows the increased risk of flooding due to projected sea level rise. Refer to the Base Plan, Section 5 Hazard Identification and Risk Assessment, Coastal Storm/Coastal Erosion/Sea Level Rise Section for results of the vulnerability analysis.

As part of the 2019 HMP planning effort, a sea level rise risk assessment was completed to determine how sea level rise may affect coastal jurisdictions and critical facilities and how coastal flooding might be exacerbated in the future. Table H.12 and Table H.13 summarize the properties at risk of inundation by sea level rise and sea level rise combined with a 1% annual chance coastal flood. The area of inundation by sea level rise and sea level rise combined with the 1% coastal flood are shown in Figure H. 11 and Figure H. 12, respectively. No critical



facilities were determined to be at risk in the sea-level rise scenarios. See subsection 5.3.7 Coastal Storm/Coastal Erosion/Sea Level Rise in the base plan for more details on the scenarios and data sources used for this analysis.

Table H.12 Properties Inundated by Sea Level Rise and Sea Level Rise with 1% Annual Chance Flood

Property Type	25-cm SLR	75-cm SLR	300-cm SLR	25-cm SLR w/ 1% Flood	75-cm SLR w/ 1% Flood	300-cm SLR w/ 1% Flood
Commercial	--	--	10	--	8	12
Government/Utilities	--	--	7	1	6	7
Other/Exempt/Misc.	--	--	13	--	12	14
Residential	--	--	14	--	9	15
Multi-Family Residential	--	--	19	--	15	28
Residential: Other	--	--	10	--	10	11
Vacant	--	--	13	--	11	16
Total	--	--	86	1	71	103

Source: Wood analysis with USGS CoSMoS 3.1 data

Table H.13 Improved Values of Properties Inundated by Sea Level Rise and Sea Level Rise with 1% Annual Chance Flood

Property Type	25-cm SLR	75-cm SLR	300-cm SLR	25-cm SLR w/ 1% Flood	75-cm SLR w/ 1% Flood	300-cm SLR w/ 1% Flood
Commercial	--	--	\$4,744,109	--	\$2,427,671	\$6,267,359
Government/Utilities	--	--	\$61,794	--	\$61,794	\$61,794
Other/Exempt/Misc.	--	--	\$5,342,495	--	\$5,342,495	\$7,605,508
Residential	--	--	\$5,286,138	--	\$4,001,139	\$5,394,363
Multi-Family Residential	--	--	\$5,157,029	--	\$4,518,175	\$8,464,474
Residential: Other	--	--	\$7,193,724	--	\$7,193,724	\$22,050,689
Vacant	--	--	\$3,248,427	--	\$2,937,427	\$5,744,835
Total	--	--	\$31,033,716	--	\$26,482,425	\$55,589,022

Source: Wood analysis with USGS CoSMoS 3.1 data

Figure H. 11 Avila Beach Sea Level Rise Scenario Analysis: Tidal Inundation Only



Figure H. 12 Avila Beach Sea Level Rise Scenario Analysis: Tidal Inundation and 1% Annual Chance Flood





Tsunami

Tsunami inundation poses a risk to all coastal communities in the County of San Luis Obispo. Offshore faults and related seismic activity could cause a tsunami event off the coast of Avila Beach, even if the faults are thousands of miles away. Avila Beach is one of the eight Tsunami Planning Area identified by the County's Tsunami Response Plan. According to the County's Tsunami Response Plan the areas within the Avila Beach community that are most vulnerable to a tsunami event include areas inland within and adjacent to San Luis Obispo Creek; this includes Avila Beach Drive, the only major road out of the beach area (refer to Figure H.13). There have been three recorded tsunami events between 1946 and 1964 that have impacted the Avila Beach community. Refer to Section 5 of the Base Plan for more information related to the past tsunami events and analysis on future vulnerability.

The following table breaks down the tsunami risk for the Avila Beach Community by property type.

Table H.14 Avila Beach's Tsunami Risk by Property Type

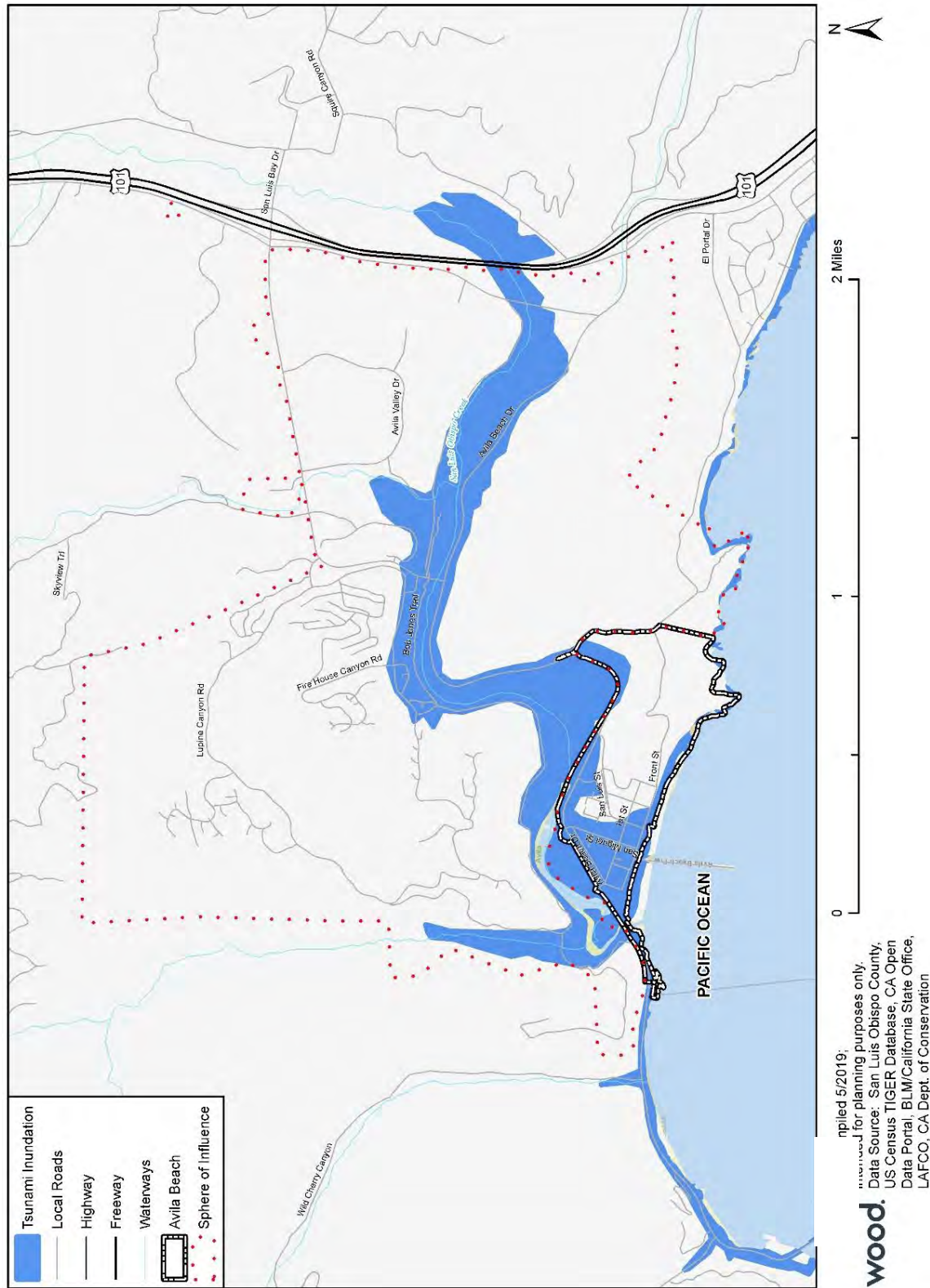
Property Type	Property Count	Improved Value	Content Value	Total Value	Loss Estimate
Commercial	15	\$7,203,045	\$7,203,045	\$14,406,090	\$14,406,090
Government/Utilities	13	\$61,794	--	\$61,794	\$61,794
Other/Exempt/Misc.	21	\$10,502,046	--	\$10,502,046	\$10,502,046
Residential	25	\$7,213,323	\$3,606,662	\$10,819,985	\$10,819,985
Multi-Family Residential	50	\$15,084,608	\$7,542,304	\$22,626,912	\$22,626,912
Residential: Other	12	\$24,819,528	\$12,409,764	\$37,229,292	\$37,229,292
Vacant	17	\$5,820,835	--	\$5,820,835	\$5,820,835
Total	153	\$70,705,179	\$30,761,775	\$101,466,954	\$101,466,954

Source: San Luis Obispo County Planning and Building Dept., Assessor's Office, ParcelQuest, Wood Plc Parcel Analysis

Based on this analysis the western portion of Avila Beach is at a significant risk to a tsunami event. There are 153 properties vulnerable to the impacts of a tsunami with a combined value of over \$101 million. Of the properties at risk, 87 are residential properties, with a majority being multi-family residential with a combined loss estimate of over \$70 million.



Figure H.13 Areas of Potential Tsunami Inundation





Wildfire

Wildfire is a high significance hazard for the Avila Beach Community Services District. There is no fire history in the community. But due to factors such as the Irish Hills, a notable topographic feature north of Avila Beach, Cal FIRE has designated the Avila Beach community as being at an increased risk from wildfires and a priority community to work with to prepare and mitigate potential fire risk. According to the County's Community Wildfire Protection Plan (2019), the prevailing wind patterns is another dominant factor that influences the wildfire risk in Avila Beach. A fire that originates in the Los Osos area or at the Diablo Canyon Power Plant could be pushed by prevailing winds southeast towards the Avila Beach community.

Analysis using GIS was used to create the following tables quantifies the potential losses by wildfire severity zones and property type. Based on the analysis there are 239 properties in Avila Beach that are located within the moderate to high severity zones with a combined value of \$143,612,173. There is one (1) critical facility, an FM transmission tower that is located in the high severity wildfire zone.

Table H.15 Avila Beach CSD's Wildfire Risk by Property Type – Moderate Severity SRA Zone

Property Type	Property Count	Improved Value	Content Value	Total Value	Loss Estimate
Commercial	15	\$7,203,045	\$7,203,045	\$14,406,090	\$14,406,090
Government/Utilities	14	\$61,794	--	\$61,794	\$61,794
Other/Exempt/Misc.	20	\$10,502,046	--	\$10,502,046	\$10,502,046
Residential	27	\$7,850,583	\$3,925,292	\$11,775,875	\$11,775,875
Multi-Family Residential	34	\$11,403,608	\$5,701,804	\$17,105,412	\$17,105,412
Residential: Other	11	\$24,360,528	\$12,180,264	\$36,540,792	\$36,540,792
Vacant	15	\$5,557,835	--	\$5,557,835	\$5,557,835
Total	136	\$66,939,439	\$29,010,405	\$95,949,844	\$95,949,844

Source: San Luis Obispo County Planning and Building Dept., Assessor's Office, ParcelQuest, Wood Plc Parcel Analysis

Table H.16 Avila Beach CSD's Wildfire Risk by Property Type – High Severity SRA Zone

Property Type	Property Count	Improved Value	Content Value	Total Value	Loss Estimate
Government/Utilities	3	--	--	\$0	\$0
Other/Exempt/Misc.	5	--	--	\$0	\$0
Residential	36	\$11,468,060	\$5,734,030	\$17,202,090	\$17,202,090
Multi-Family Residential	52	\$18,320,256	\$9,160,128	\$27,480,384	\$27,480,384
Residential: Other	3	\$1,772,192	\$886,096	\$2,658,288	\$2,658,288
Vacant	4	\$321,567	--	\$321,567	\$321,567
Total	103	\$31,882,075	\$15,780,254	\$47,662,329	\$47,662,329

Source: San Luis Obispo County Planning and Building Dept., Assessor's Office, ParcelQuest, Wood Plc Parcel Analysis

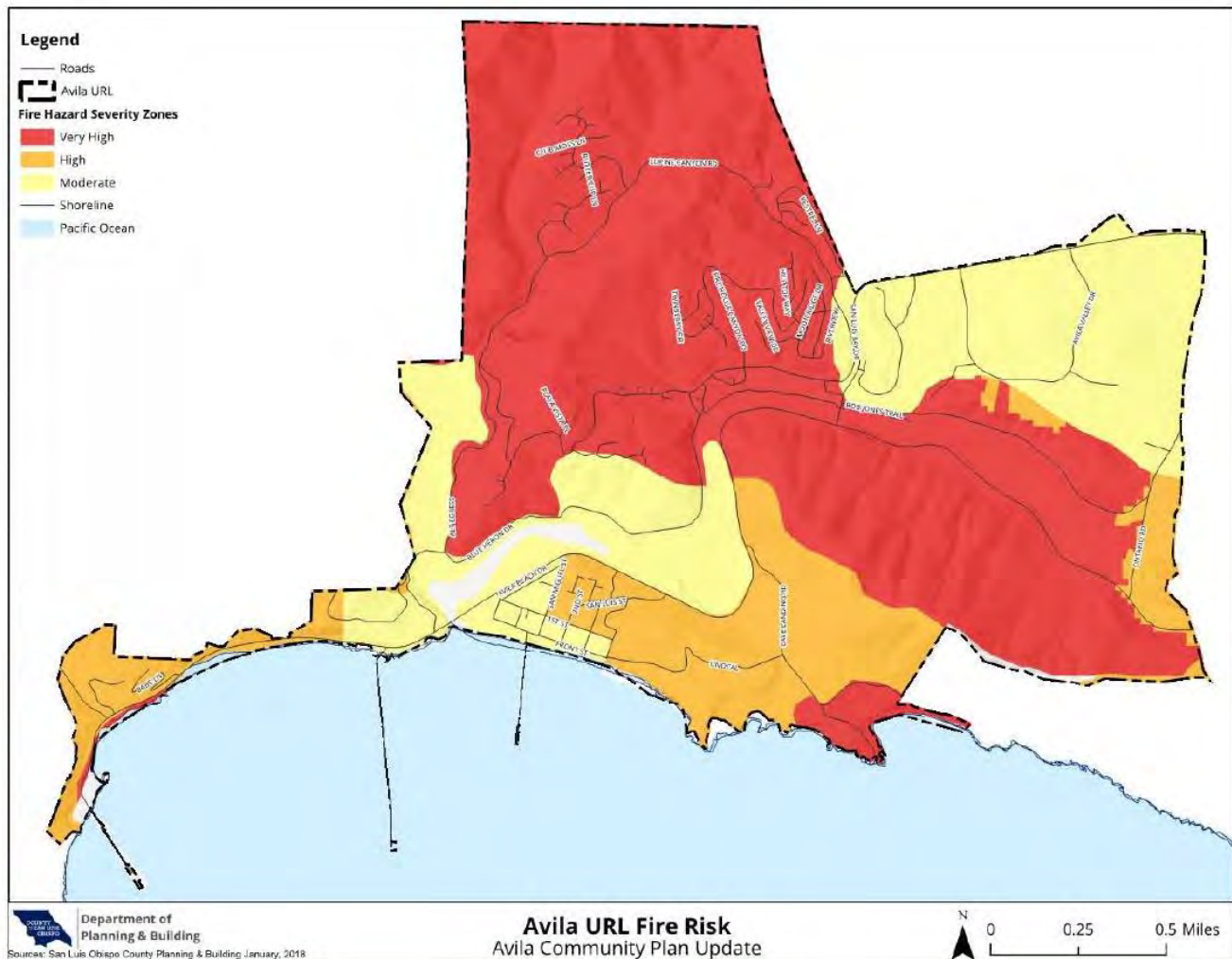
Table H.17 Avila Beach CSD's Critical Facilities in High Wildfire Hazard Zone

Facility Type	Count
FM Transmission Tower	1
Total	1

Source: San Luis Obispo County Planning and Building Dept., Assessor's Office, ParcelQuest, Wood Plc Parcel Analysis

The figure below depicts the wildfire risk for the Avila Community.

Figure H.14 Avila Beach CSD Wildfire Risk



Source: Avila Community Plan, Background Report, August 2018

Human Caused: Hazardous Materials

The Avila Beach community has a history of hazardous material incidents. The California State Water Resources Control Board has identified seven (7) sites with hazardous materials that may contaminate groundwater supplies. Six of the identified sites have been closed and one remains an open case, site of the former Unocal Tank Farm site which contained twenty-two (22) storage units for over 90 years and were a dominate visual feature in Avila Beach. After an oil spill that was caused by Unocal (a subsidiary of Chevron) resulted in extensive cleanup of Avila Beach including removing and rebuilding the entire commercial district, the tanks were removed, and the Tank Farm site was used to support the cleanup efforts. Today, the area is the one industrial zone property in Avila Beach and is completely fenced off to the public. Chevron maintains the limited sewage disposal system and fire protection facilities for the site and receives water from the Avila Beach Community Services District. In 2013 Chevron applied to re-develop the site into a resort facility. The County of San Luis Obispo Planning Department held a well-attended CEQA scoping meeting in 2016. Since the initial scoping meeting, Chevron has not made any additional efforts to re-develop the site. According to the Avila Beach Community Plan Background Report (2018) no progress has been made yet.

Figure H.15 Avila Beach Community Evolution, 1996 – 2000



1996



2000

Source: San Luis Obispo Tribune, David Middle Camp

Figure H.16 Avila Beach During Unocal Cleanup, 1999



Source: San Luis Obispo Tribune, Jayson Mellom



The Diablo Canyon Nuclear Power Plant, the state's only operating nuclear power plant is located west of Avila Beach. Accidental release of nuclear materials continues to be a concern for the Avila community, although the Power Plant has extensive seismic monitoring and safety systems in place and has been retrofitted to withstand a 7.5 magnitude earthquake. Avila Beach Drive is currently the only access to the Diablo Canyon Power Plant, which has also caused concern within the community if an evacuation were to happen. The Diablo Canyon Nuclear Power Plant is scheduled to be closed by 2025. Even with the coming closure, the County of San Luis Obispo Office of Emergency Services has done extensive planning in case of an emergency at the Power Plant. Refer to Section 5 of the Base Plan for more information.

H.4 Capability Assessment

Capabilities are the programs and policies currently in use to reduce hazard impacts or that could be used to implement hazard mitigation activities. This capabilities assessment is divided into five sections: regulatory mitigation capabilities, administrative and technical mitigation capabilities, fiscal mitigation capabilities, mitigation outreach and partnerships, and other mitigation efforts.

To develop this capability assessment, the jurisdictional planning representatives used a matrix of common mitigation activities to inventory which of these policies or programs were in place. The team then supplemented this inventory by reviewing additional existing policies, regulations, plans, and programs to determine if they contributed to reducing hazard-related losses.

During the plan update process, this inventory was reviewed by the jurisdictional planning representatives and Wood consultant team staff to update information where applicable and note ways in which these capabilities have improved or expanded. In summarizing current capabilities and identifying gaps, the jurisdictional planning representatives also considered their ability to expand or improve upon existing policies and programs as potential new mitigation strategies. The Avila Beach CSD capabilities are summarized below.

H.4.1 Regulatory Mitigation Capabilities

Table H.18 identifies existing regulatory capabilities the District has in place to help with future mitigation efforts. Note, many of the regulatory capabilities that can be used for the District are within the County's jurisdiction. Refer to Section 6 Capability Assessment of the Base Plan for more information related to the County's mitigation capabilities.

Table H.18 Avila Beach CSD Regulatory Mitigation Capabilities

Regulatory Tool	Yes/No	Comments
General plan	Yes	SLO County General Plan; Coastal Zone Framework
Zoning ordinance	Yes	Coastal Zone Land Use Ordinance
Subdivision ordinance	No	
Growth management ordinance	No	
Floodplain ordinance	N/A	
Other special purpose ordinance (stormwater, water conservation, wildfire)	Yes	County
Building code	Yes	County
Fire department ISO rating	Yes	6 (Cal Fire/SLO County Fire Department)
Erosion or sediment control program	No	
Stormwater management program	No	
Site plan review requirements	No	
Capital improvements plan	Yes	





Regulatory Tool	Yes/No	Comments
Economic development plan	Yes	Avila Beach Specific Plan 2001, Chapter 6 Economic Recovery Strategy
Local emergency operations plan	Yes	County Operation Plans
Other special plans	Yes	Avila Beach Community Plan - Background Report; August 2019; Avila Beach Specific Plan 2001;
Flood Insurance Study or other engineering study for streams	No	
Elevation certificates (for floodplain development)	No	

Source: Wood Data Collection Guide, 2019

H.4.2 Administrative/Technical Mitigation Capabilities

Table H.19 identifies the personnel responsible for activities related to mitigation and loss prevention in the Avila Beach Community Services District.

Table H.19 Avila Beach CSD Administrative/Technical Mitigation Capabilities

Personnel Resources	Yes/ No	Department/Position
Planner/engineer with knowledge of land development/land management practices	Yes	SLO County Public Works and Planning & Building
Engineer/professional trained in construction practices related to buildings and/or infrastructure	Yes	Avila Beach CSD General Manager/District Engineer
Planner/engineer/scientist with an understanding of natural hazards	Yes	SLO County Planning and Building
Personnel skilled in GIS	Yes	SLO County
Full time building official	Yes	SLO County Planning and Building
Floodplain manager	N/A	
Emergency manager	Yes	SLO County Emergency Services
Grant writer	No	
Other personnel	N/A	
GIS Data Resources (Hazard areas, critical facilities, land use, building footprints, etc.)	Yes	SLO County
Warning systems/services (Reverse 9-11, outdoor warning signals)	Yes	SLO County

Source: Wood Data Collection Guide, 2019

H.4.3 Fiscal Mitigation Capabilities

Table H.20 identifies financial tools or resources that the CSD could potentially use to help fund mitigation activities.

**Table H.20 Avila Beach CSD Fiscal Mitigation Capabilities**

Financial Resources	Accessible/Eligible to Use (Yes/No)
Community Development Block Grants	No
Capital improvements project funding	Yes
Authority to levy taxes for specific purposes	No
Fees for water, sewer, gas, or electric services	Yes
Impact fees for new development	Yes
Incur debt through general obligation bonds	No
Incur debt through special tax bonds	No
Incur debt through private activities	No
Withhold spending in hazard prone areas	No

H.4.4 Mitigation Outreach and Partnerships

Responsible Water Use Outreach Program: The Avila Beach Community Services District runs a responsible water use outreach program to encourage conservation and efficiency by sending out public notices for water conversation and responsible water use with monthly water and sewer bills.

Monitor Water Supply: The District monitors the amount of water purchased and the amount of water sold each month. This alerts the District to the potential for leaks and water supply losses.

Plan for Drought: The District has developed a Water Shortage Emergency Action Plan. The Plan includes water supply trigger levels and authorizes the District to take drought related actions to limit water use and in extreme cases limit new development.

Map and Assess Vulnerability to Tsunami: Via on-call consultants, the District has access to GIS mapping tools that can identify areas that are vulnerable to tsunamis inundation.

Protect District Buildings and Infrastructure: The District's WWTP is located in an area that could be impacted by a tsunami. The District has taken steps to protect structures from tsunamis; informed staff on emergency procedures; and provided vertical evacuation options.

Wildfire Management: The District implements their fire management responsibilities via a contact with Cal-Fire. Cal Fire management staff attends the District's monthly Board of Director meetings and always provide suggested mitigation measures for managing and mitigating Wildfire risks.

Fire-Resistant Construction: The District encourages customers and implements the use fire-resistant construction materials as part of their capital improvement program.

Create Defensible Space Around Structures and Infrastructure: The District maintains a fire buffer around all District facilities and buildings and the District routinely inspections the facilities.

Wildfire Risk Awareness: As noted above, Cal Fire Staff attend all District Board of Director meetings and provide fire safe suggestions; offer to conduct local outreach; and assist with the preparation of Fire Counsel Grant applications to reduce wildfire hazards.

H.4.5 Opportunities for Enhancement

Based on the capability assessment, the Avila Beach Community Services District has several existing mechanisms in place that already help to mitigate hazards. There are also opportunities for the District to expand or improve on these policies and programs to further protect the community. Future improvements may





include providing training for staff members related to hazards or hazard mitigation grant funding in partnership with the County and Cal OES. Additional training opportunities will help to inform District staff and board members on how best to integrate hazard information and mitigation projects into the District policies and ongoing duties of the District. Continuing to train District staff on mitigation and the hazards that pose a risk to the Avila Beach Community Services District will lead to more informed staff members who can better communicate this information to the public.

H.5 Mitigation Strategy

H.5.1 Mitigation Goals and Objectives

The Avila Beach CSD adopts the hazard mitigation goals and objectives developed by the HMPC and described in Section 7 Mitigation Strategy.

H.5.2 Mitigation Actions

The planning team for the Avila Beach Community Services District identified and prioritized the following mitigation actions based on the risk assessment. Actions were prioritized using the process described in subsection 7.2.1 of the Base Plan. Background information and information on how each action will be implemented and administered, such as ideas for implementation, responsible office, potential funding, estimated cost, and timeline are also included. Actions with an '*' are those that mitigate losses to future development.

As noted in subsection H.4.4 Mitigation Outreach and Partnerships the District has done previous work to mitigate drought, tsunami, and wildfire. Due to limited resources and District responsibilities, including limited staff time, the Avila Beach CSD has chosen not to undertake additional mitigation actions against drought, tsunami, and wildfire at this time.



**Table H. 21 Avila Beach Community Service District's Mitigation Action Plan**

ID	Hazard(s) Mitigated	Description/Background/Benefits	Lead Agency and Partners	Cost Estimate	Potential Funding	Priority	Timeline	Status/Implementation Notes
AB.1	Coastal Storm/Coastal Erosion/Sea Level Rise; Flood; Landslide and debris flow; Earthquake	Avila Beach Revetment Repairs to ensure Avila Beach Drive doesn't fail due to erosion and undermining or landslide.	County of SLO; Port San Luis Harbor District; Avila Beach CSD	Over \$1,000,000	County of SLO; SLOCOG; PSLHD;	Medium	More than 5 yrs.	New Partner with Port San Luis Harbor District on solution (see Action PS.3 in the Harbor District's annex). Survey existing jetty; develop repair and augmentation plan; repair revetment. The road is also at risk of landslide. Benefits: Ensures The road is essential for access to Diablo Canyon NPP and Port San Luis.
AB.2	Coastal Storm/Coastal Erosion/Sea Level Rise; flood	Avila Beach Drainage Improvements to include a solution for drainage which accumulates along Beach Colony Lane and the Avila Parking Lot; install pump station or diversion for flood waters; identify funding for long-term operations and maintenance.	County of SLO; Port San Luis Harbor District; Avila Beach CSD Avila Beach property owners	\$500,000 to \$1,000,000	SLO County; property owners; FEMA HMA	Medium	More than 5 yrs.	New Partner with Port San Luis Harbor District on solution (see Action PS.4 in the Harbor District's annex). Benefits: Flood prevention in low-lying areas in Avila Beach; reduction of health hazards caused by flooding



H.6 Implementation and Maintenance

Moving forward, the Avila Beach Community Services District will use the mitigation action table in the previous section to track progress on implementation of each project. Implementation of the plan overall is discussed in Section 8 in the Base Plan.

H.6.1 Incorporation into Existing Planning Mechanisms

The information contained within this plan, including results from the Vulnerability Assessment, and the Mitigation Strategy will be used by the Community Services District to help inform updates of the Avila Beach Community Plan and in the development of additional local plans, programs and policies. Understanding the hazards that pose a risk and the specific vulnerabilities to the jurisdiction will help in future capital improvement planning for the District. The County Planning and Building Department may utilize the hazard information when reviewing a site plan or other type of development applications with the boundaries of the Avila Beach Community Services District area. As noted in Section 8 Implementation and Monitoring the HMPC representatives from the Avila Beach Community Services District will report on efforts to integrate the hazard mitigation plan into local plans, programs and policies and will report on these efforts at the annual HMPC plan review meeting.

H.6.2 Monitoring, Evaluation and Updating the Plan

The Avila Beach Community Services District will follow the procedures to monitor, review, and update this plan in accordance with San Luis Obispo County as outlined in Section 8 of the Base Plan. The District will continue to involve the public in mitigation, as described in subsection 8.3 of the Base Plan. The CSD General Manager will be responsible for representing the Community Services District in the County HMPC, and for coordination with County staff and departments during plan updates. The Avila Beach Community Services District realizes it is important to review the plan regularly and update it every five years in accordance with the Disaster Mitigation Act Requirements as well as other State of California requirements.





I.1 District Profile

I.1.1 Mitigation Planning History and 2019 Process

This Annex was created during the development of the 2019 San Luis Obispo County Hazard Mitigation Plan Update. The General Manager of the Ground Squirrel Hollow Community Services District (CSD) was the representative on the County HMPC and took the lead for developing the plan and this annex in coordination with the Ground Squirrel Hollow Community Services District Local Planning Team. The local (District) Planning Team will be responsible for implementation and maintenance of the plan. See Table I.1 for more information on the local Planning Team.

Table I.1 Ground Squirrel Hollow CSD Hazard Mitigation Plan Planning Team

Department or Stakeholder	Title
Ground Squirrel Hollow CSD	General Manager

More details on the planning process followed and how the jurisdictions, services districts and stakeholders participated can be found in Section 3 of the Base Plan, along with how the public was involved during the 2019 update.

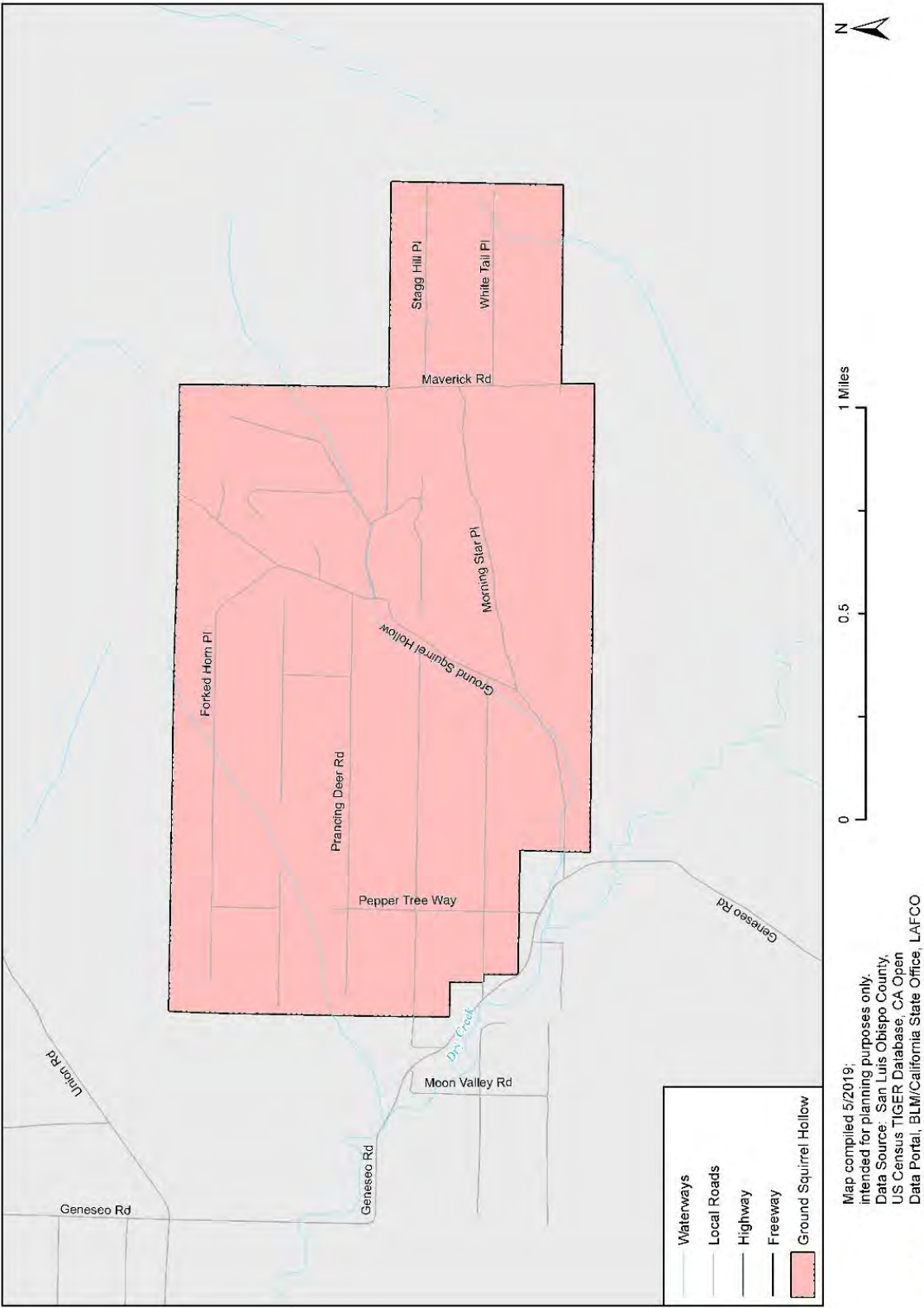
I.1.2 District Overview

Ground Squirrel Hollow is a rural community located about ten miles east of the City of Paso Robles. The Ground Squirrel Hollow Community Services District was established in June 2004 for the purpose of providing road maintenance services to residents within its respective boundaries. In March 2014, the District began providing solid waste services to residents located within its boundaries. The District strives to provide these services in the most cost-effective and efficient manner possible. The District is governed by an elected Board of Directors and is managed by a general manager and a member of the County Board of Supervisors. The District serves 375 homes within its boundaries. Figure I.1 shows the Ground Squirrel Hollow Community Services District (CSD) boundaries.





Figure I.1 Ground Squirrel Hollow Community Services District





I.1.3 Development Trends

The District is almost 70% developed, with 375 of the 525 rural residential parcels within the Ground Squirrel Hollow CSD having been developed. The Planning Team noted that several of the undeveloped parcels do not have frontage on an improved road. Developing those parcels would require building the necessary access to minimum District standards (20' wide double chip seal), and the District would then take ownership and maintain the road in perpetuity.

I.1.4 Other Community Planning Efforts

Coordination and synchronization with other community planning mechanisms and efforts are vital to the success of this plan. To have a thorough evaluation of hazard mitigation practices already in place, appropriate planning procedures should also involve identifying and reviewing existing plans, policies, regulations, codes, tools, and other actions designed to reduce a community's risk and vulnerability from natural hazards.

As an unincorporated community, the Ground Squirrel Hollow CSD is referenced in other County planning documents and regulated by County policies and planning mechanisms. Integrating existing planning efforts, mitigation policies, and action strategies into this annex establishes a credible, comprehensive document that weaves the common threads of a community's values together. The development of this jurisdictional annex involved a comprehensive review of existing plans, studies, reports, and initiatives from San Luis Obispo County and the Ground Squirrel Hollow community that relate to hazards or hazard mitigation. A high-level summary of the key plans, studies and reports is summarized in Table I.2. Information on how they informed the update are noted and incorporated where applicable.

Table I.2 Summary of Review of Key Plans, Studies and Reports

Plan, Study, Report Name	How the Document Informed this Annex
County of San Luis Obispo Local Hazard Mitigation Plan (2014)	Informed past hazard event history.
Unit Strategic Fire Plan – CAL FIRE/San Luis Obispo County Fire (2018)	Informed wildfire vulnerability assessment
Community Wildfire Protection Plan – San Luis Obispo County (2019)	Informed wildfire vulnerability assessment

The Ground Squirrel Hollow CSD District Codes are the main planning mechanism to regulate development within the District's boundaries. In addition to the standards within the District Code, the following planning mechanisms regulate future and existing development and activities within the Ground Squirrel Hollow CSD planning area.

- California Government Code Section 61100(c)
- California Government Code Section 61100(i)
- Solid Waste Disposal Code of Ordinances
- Ground Squirrel Hollow CSD Developer's Guide
- Various Ground Squirrel Hollow CSD Resolutions
- San Luis Obispo County Public Improvement Standards

Refer to subsection I.4 Capability Assessment as well as the Base Plan for more information on the plans, policies, regulations and staff that govern the Ground Squirrel Hollow CSD.





I.2 Hazard Identification and Summary

The Ground Squirrel Hollow CSD planning team identified the hazards that affect the District and summarized their frequency of occurrence, spatial extent, potential magnitude, and significance specific to the Ground Squirrel Hollow CSD (see Table I.3). There are no hazards that are unique to the District.

Table I.3 Ground Squirrel Hollow CSD – Hazard Summaries

Hazard	Geographic Area	Probability of Future Occurrence	Magnitude/Severity (Extent)	Overall Significance
Adverse Weather	Limited	Likely	Negligible	Medium
Landslides and Debris Flow	Limited	Highly Likely	Negligible	Medium
Earthquake	Limited	Occasional	Negligible	Medium
Wildfire	Extensive	Occasional	Critical	Medium
Geographic Area Limited: Less than 10% of planning area Significant: 10-50% of planning area Extensive: 50-100% of planning area Probability of Future Occurrences Highly Likely: Near 100% chance of occurrence in next year or happens every year. Likely: Between 10 and 100% chance of occurrence in next year or has a recurrence interval of 10 years or less. Occasional: Between 1 and 10% chance of occurrence in the next year or has a recurrence interval of 11 to 100 years. Unlikely: Less than 1% chance of occurrence in next 100 years or has a recurrence interval of greater than every 100 years.		Magnitude/Severity (Extent) Catastrophic—More than 50 percent of property severely damaged; shutdown of facilities for more than 30 days; and/or multiple deaths Critical—25-50 percent of property severely damaged; shutdown of facilities for at least two weeks; and/or injuries and/or illnesses result in permanent disability Limited—10-25 percent of property severely damaged; shutdown of facilities for more than a week; and/or injuries/illnesses treatable do not result in permanent disability Negligible—Less than 10 percent of property severely damaged, shutdown of facilities and services for less than 24 hours; and/or injuries/illnesses treatable with first aid Significance Low: minimal potential impact Medium: moderate potential impact High: widespread potential impact		

I.3 Vulnerability Assessment

The intent of this section is to assess the Ground Squirrel Hollow Community Services District's vulnerability separately from that of the planning area, which has already been assessed in Section 5 Hazard Identification and Risk Assessment (HIRA) in the base plan. This vulnerability assessment analyzes the population, property, and other assets at risk to hazards ranked of medium or high significance.

The information to support the HIRA portion of this Annex was collected through a Data Collection Guide, which was distributed to each participating municipality or district to complete during the planning process. Information collected was analyzed and summarized in order to identify and rank all the hazards that could impact anywhere within the County, as well as to rank the hazards and identify the related vulnerabilities unique to each jurisdiction/district. In addition, the Ground Squirrel Hollow CSD Planning Team members were asked to share information on past significant hazard events that have affected the District.



Each participating jurisdiction and district were in support of the main hazard summary identified in the Base Plan (See Section 5). However, the hazard summary rankings for each jurisdictional annex may vary slightly due to specific hazard risk and vulnerabilities unique to that jurisdiction (See Table I.3). Identifying these differences helps the reader to differentiate the jurisdiction's risk and vulnerabilities from that of the overall County.

Note: The hazard "significance" reflects overall ranking for each hazard and is based on the Ground Squirrel Hollow CSD planning team input from the Data Collection Guide and the risk assessment results compiled during the planning process (see Section 5 of the Base Plan), which included more detailed quantitative analyses with best available data. The hazard summaries in Table I.3 reflect the hazards that could potentially affect the District. The discussion of vulnerability for each of the hazards listed is in subsection I.3.2 Estimating Potential Losses.

The hazard summaries in Table I.3 reflect the hazards that could potentially affect the District. Those of Medium or High significance for the Ground Squirrel Hollow CSD are identified below. The discussion of vulnerability for each of the following hazards is in I.3.2 Estimating Potential Losses.

- Adverse Weather
- Landslides and Debris Flow
- Earthquake/Liquefaction
- Wildfire

Other Hazards

Hazards assigned a significance rating of low and which do not differ significantly from the County ranking (e.g., Low vs. High) are not addressed further in this plan and are not assessed individually for specific vulnerabilities in this section. In the Ground Squirrel Hollow CSD, agricultural pests and plant diseases and biological agents are the only hazard ranked as a low significance for the Ground Squirrel Hollow community.

Additionally, the Planning Team decided to rate several hazards as Not Applicable (N/A) to the planning area due to lack of exposures, vulnerability, or no probability of occurrence. The following hazards were ranked as Not Applicable for the Ground Squirrel Hollow Community Services District.

- Dam failure
- Drought
- Flooding
- Subsidence
- Tsunami and Seiches
- Coastal Storm/Coastal Erosion/Sea Level Rise

I.3.1 Assets at Risk

This section considers the District's assets at risk, including values at risk, critical facilities and infrastructure, historic assets, economic assets, and growth and development trends. See subsection 5.2 of the Base Plan (Asset Summary) for more details and background on the parcel summarization, analysis, and datasets available.

Values at Risk

The following data on property exposure is derived from the San Luis Obispo County 2017 Parcel and Assessor data. This data should only be used as a guideline to overall values in the Community Services District as the information has some limitations. The most significant limitation is created by Proposition 13; instead of adjusting property values annually, the values are not adjusted or assessed at fair market value until a property transfer occurs. As a result, overall value information is likely low and does not reflect current market value of properties. It is also important to note that in the event of a disaster, it is generally the value of the infrastructure or improvements to the land that is of concern or at risk. Generally, the land itself is not a loss. Table I.4 shows





the exposure of properties (e.g., the values at risk) broken down by property type for the Ground Squirrel Hollow Community Services District.

Table I.4 2019 Property Exposure for Ground Squirrel Hollow CSD by Property Types

Property Type	Parcel Count	Improved Value	Content Value	Total Value
Government/Utilities	1	--	--	\$0
Mobile/Manufactured Homes	16	\$2,140,722	\$1,070,361	\$3,211,083
Residential	358	\$84,252,270	\$42,126,135	\$126,378,405
Vacant	1	\$3,308	--	\$3,308
Total	376	\$86,396,300	\$43,196,496	\$129,592,796

Source: Wood Plc analysis based on ParcelQuest and San Luis Obispo County Assessor's Office data 2019

Critical Facilities and Infrastructure

A critical facility is one that is essential in providing utility or direction either during the response to an emergency or during the recovery operation. The four types of Critical Facilities categorized by San Luis Obispo County and its jurisdictions' and districts' planning teams are: Emergency Services, High Potential Loss Facilities, Lifeline Utility Systems, and Transportation Systems. Refer to subsection 5.2 of the base plan for more information on the assets used throughout this annex and the county-wide analysis. No critical facilities in the Ground Squirrel Hollow Community Services District were found based on San Luis Obispo County GIS data and structures obtained from the Homeland Infrastructure Foundation-Level Dataset (HIFLD).

Transportation and Lifeline Facilities

The Ground Squirrel Hollow Planning Team identified the road system, with a replacement value of \$3 million, as critical to the community. Prior to the January 2017 storm, half of the District's roads were constructed from Class II Base material and required substantial and expensive maintenance. In 2017, the District secured private financing and constructed the Chip Seal Project, which added base and an asphalt double-chip seal to those roads. Despite being better protected from winter weather, all the District's roads will need periodic maintenance (chip seal, cape seal, and/or fog seal overlays) from time to time in order to achieve a life expectancy beyond the payback period of the financing. One concern of the Planning Team is that available funding will not be adequate to provide the needed maintenance, or that the District will not be able to afford a similar project in the future due to rising costs and limited funding.

Historic and Cultural Resources

No historic or cultural resources have been identified in the Ground Squirrel Hollow CSD.

Natural Resources

Natural resources are important to include in benefit-cost analyses for future projects and may be used to leverage additional funding for projects that also contribute to community goals for protecting sensitive natural resources. Awareness of natural assets can lead to opportunities for meeting multiple objectives. For instance, protecting wetlands areas protects sensitive habitat as well as attenuates and stores floodwaters.

Economic Assets

Ground Squirrel Hollow is a residential area, and there is very little commercial development.



I.3.2 Estimating Potential Losses

Note: This section details vulnerability to specific hazards of high or medium significance, where quantifiable, and/or where (according to Planning Team input) it significantly differs from that of the overall County.

Table I.4 under subsection I.3.1 summarizes Ground Squirrel Hollow's exposure in terms of number and value of parcels falling within the District's boundaries. San Luis Obispo County's parcel and assessor data was used to calculate the improved value of parcels, using ParcelQuest's spatial layers on parcel geometry. The most vulnerable structures are those in the parcels within hazard threat areas such as unreinforced masonry buildings, and buildings built prior to the introduction of modern-day building or land regulatory codes. Impacts of past events and vulnerability to specific hazards are further discussed below as particular to each hazard. See Section 5 of the Base Plan for more information on assets, parcel analysis methodology, and hazard profiles.

Adverse Weather

Adverse weather was rated as **Medium Significance** for the District. For the District adverse weather includes thunderstorms, heavy rain, lightning, high winds, and extreme heat. The area receives about 13 inches of precipitation annually, most of which occurs in the wintertime. In January of 2017, heavy rains caused erosion and damage to Silverado Road, Lone Pine Road, and Prancing Deer Place. This limited neighborhood access for residents, commercial vehicles, and emergency vehicles. The Ground Squirrel Hollow CSD received \$21,695 in federal and state disaster relief funding following the event to repair the impacted roads. Refer to subsection 5.3.1 of the Base Plan for additional information on the risk adverse weather poses the County of San Luis Obispo.

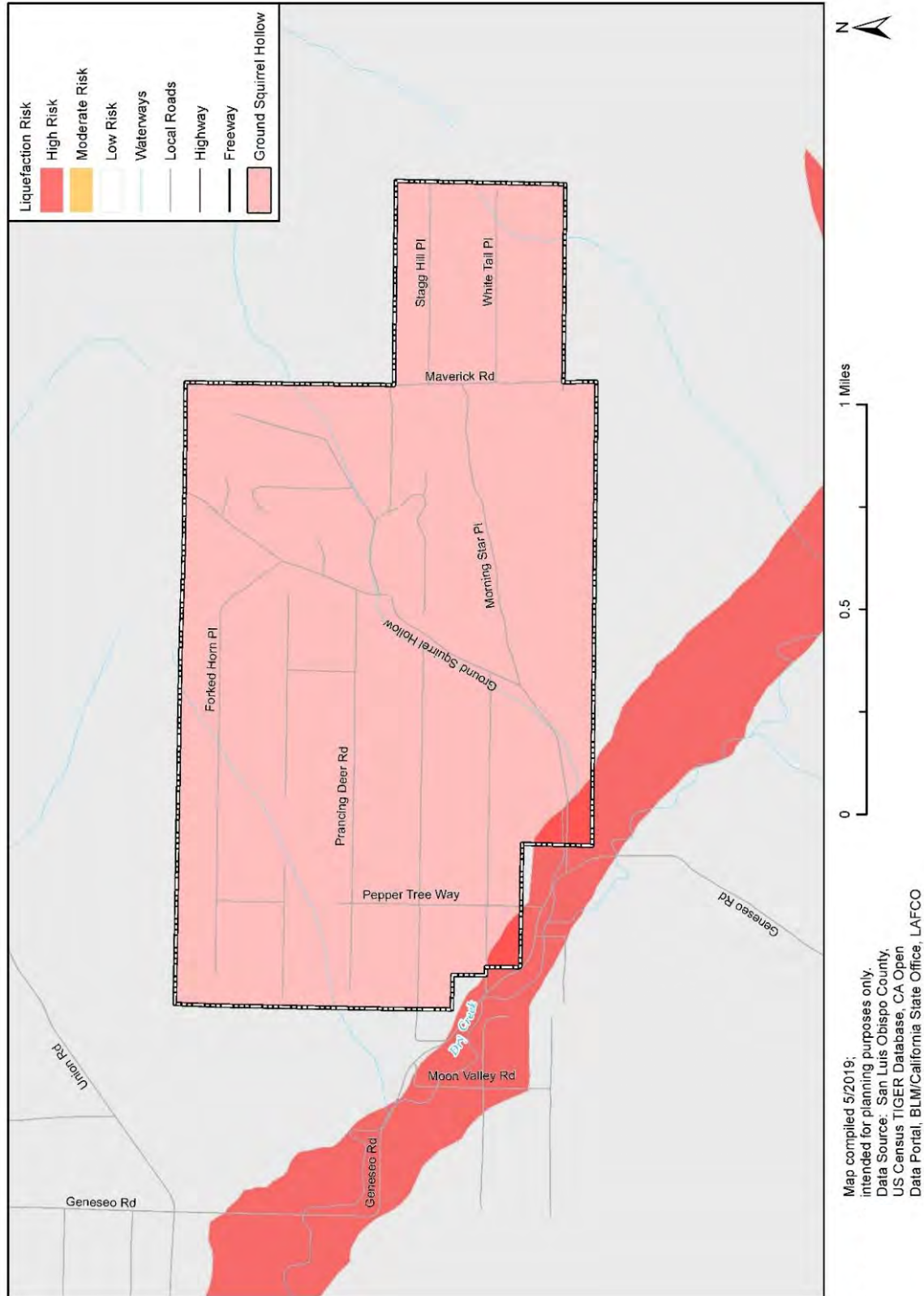
Liquefaction

Earthquake hazards, specifically liquefaction was rated as **Medium Significance** for the District. There are no mapped active or potentially active faults in the Ground Squirrel Hollow planning area. Despite this, the area is exposed to seismic hazards from movement along several regional faults. As shown in Figure I.2, the southwestern corner of the CSD's boundaries near Dry Creek is at high risk of liquefaction as a result of an earthquake event.





Figure I.2 Liquefaction Risk in Ground Squirrel Hollow Community Services District





Residential properties are the only properties at risk of liquefaction. There are six residential properties in total within this high-risk liquefaction zone which have a total value of over \$2 million, refer to Table I.5 below.

Table I.5 Ground Squirrel Hollow CSD Liquefaction Risk by Property Type – High Risk

Property Type	Property Count	Improved Value	Content Value	Total Value
Residential	6	\$1,367,108	\$683,554	\$2,050,662
Total	6	\$1,367,108	\$683,554	\$2,050,662

Source: San Luis Obispo County Planning and Building Dept., Assessor's Office, ParcelQuest, Wood Plc Parcel Analysis

Landslides and Debris Flows

Landslides and debris flow were rated as a **Medium Significance** for the Ground Squirrel Hollow CSD and noted by the Planning team as being highly likely to occur. As shown in Figure I.3, about one-third of the District, particularly the eastern portion, is at moderate risk of landslide. According to the GIS analysis, 101 properties with a total value of over \$33 million are at moderate risk of landslides. Of those properties, 96 residential properties are most vulnerable to landslides events. All properties located in the moderate landslide potential zone are detailed in Table I.6.

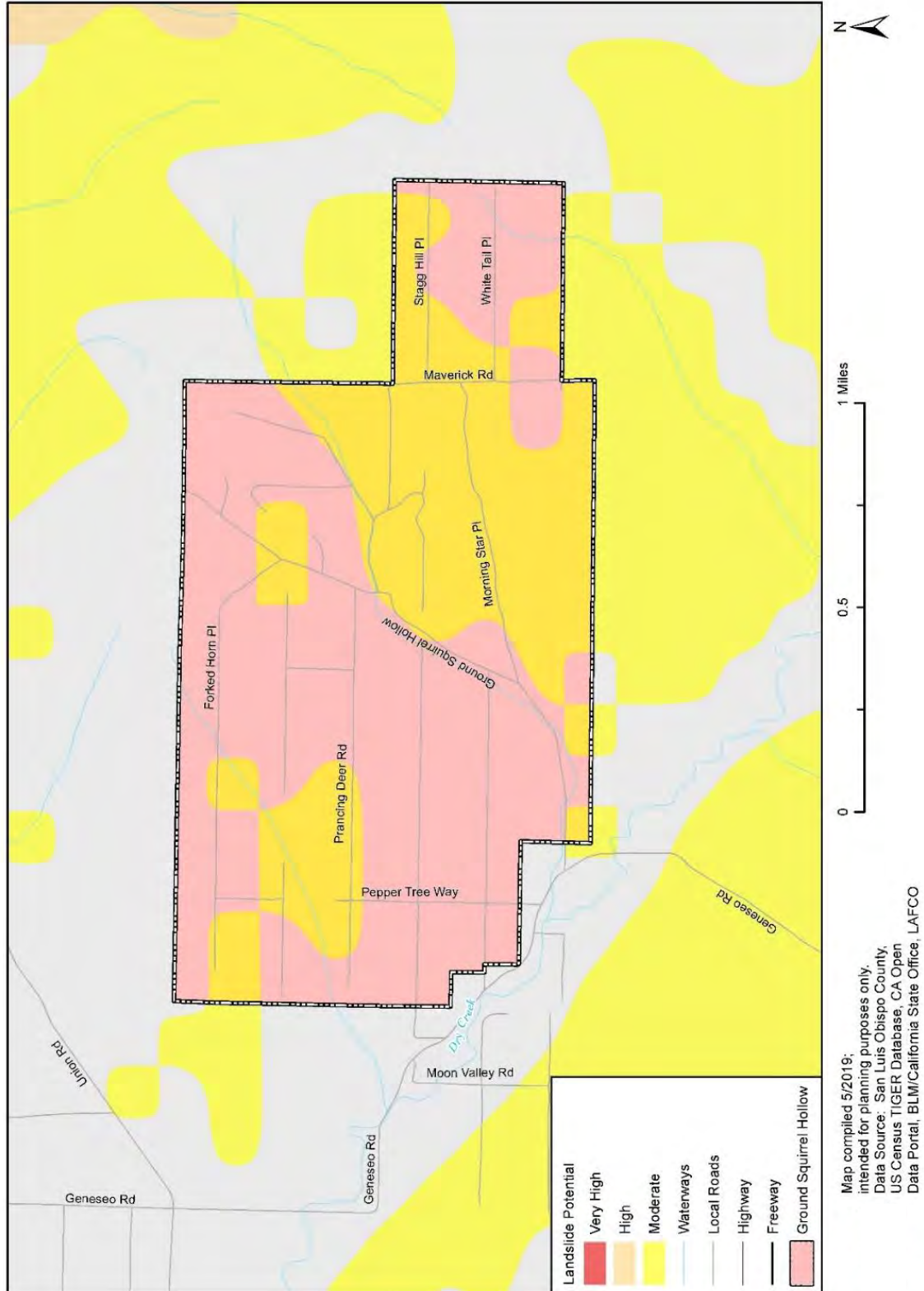
Table I.6 Ground Squirrel Hollow CSD Parcels in Moderate Landslide Potential by Parcel Type

Property Type	Property Count	Improved Value	Content Value	Total Value
Government/Utilities	1	--	--	\$0
Mobile/Manufactured Homes	4	\$710,950	\$355,475	\$1,066,425
Residential	96	\$21,828,153	\$10,914,077	\$32,742,230
Total	101	\$22,539,103	\$11,269,552	\$33,808,655

Source: San Luis Obispo County Planning and Building Dept., Assessor's Office, ParcelQuest, Wood Plc Parcel Analysis



Figure I.3 **Landslide Potential Areas in Ground Squirrel Hollow Community Services District**





Wildfire

The San Luis Obispo County's 2019 Community Wildfire Protection Plan (CWPP) divides the County into multiple planning areas to facilitate localized pre-fire planning efforts. The Ground Squirrel Hollow community is within Planning Area 5. The main fuel type in this planning area is grassland and the CWPP states that there no history of large fires or extend attack. However, smaller wildfires have occurred such as the 4-acre brush fire that took place in June of 2013 near Ground Squirrel Hollow Road and White Tail Place. Four fire engines from Cal Fire responded and the fire was extinguished with no reports of property damage or injuries.

As shown in Figure I.4 and Table I.7, all of the Ground Squirrel Hollow CSD boundaries are located within a high wildfire severity zone. A total of 376 properties are vulnerable to a wildfire event; 95 percent of those properties are residential.

Table I.7 Ground Squirrel Hollow CSD Wildfire Risk by Property Type – High Severity SRA Zone

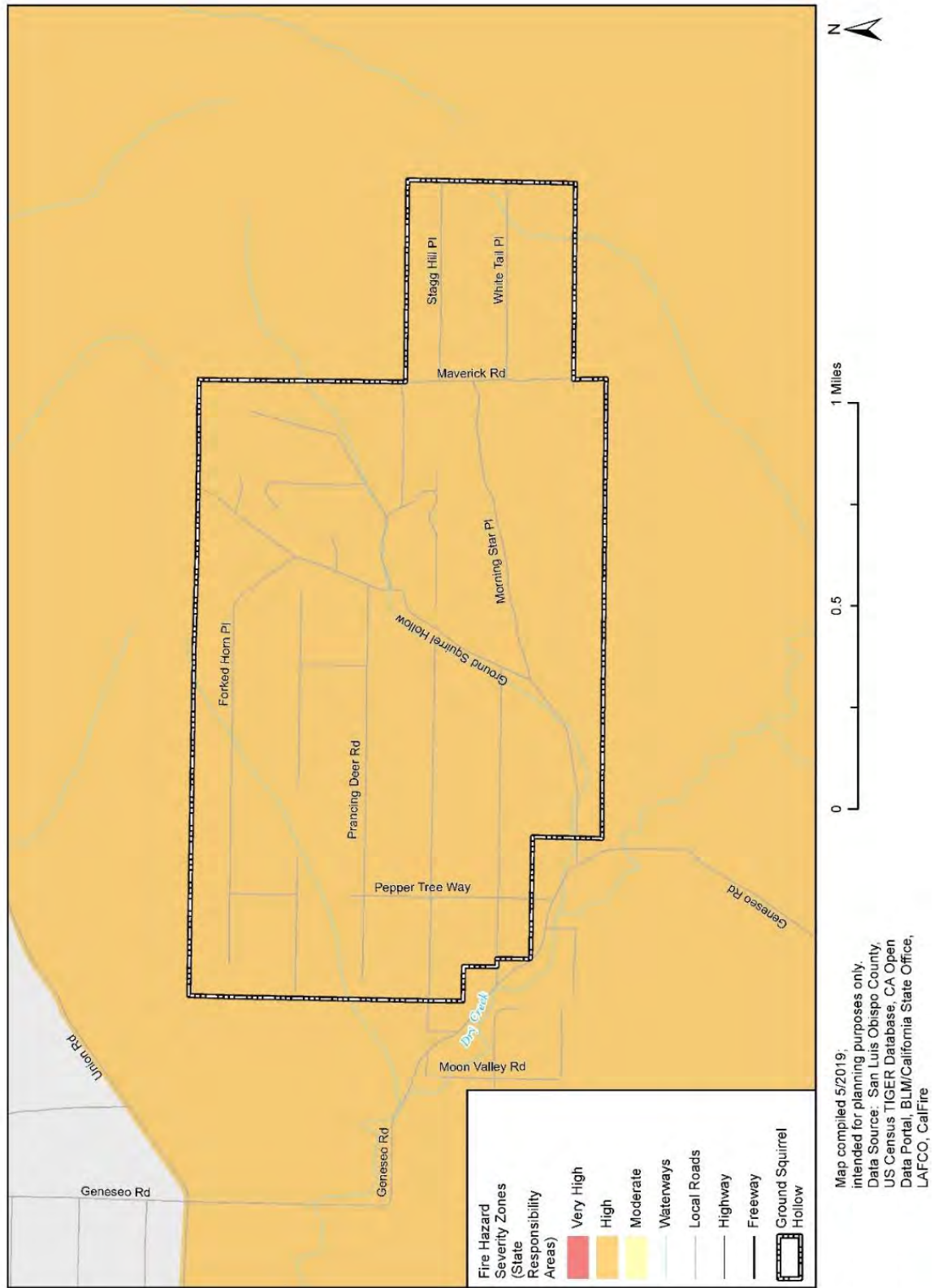
Property Type	Property Count	Improved Value	Content Value	Total Value	Loss Estimate	Population
Government/Utilities	1	--	--	\$0	\$0	--
Mobile/Manufactured Homes	16	\$2,140,722	\$1,070,361	\$3,211,083	\$3,211,083	40
Residential	358	\$84,252,270	\$42,126,135	\$126,378,405	\$126,378,406	899
Vacant	1	\$3,308	--	\$3,308	\$3,308	--
Total	376	\$86,396,300	\$43,196,496	\$129,592,796	\$129,592,796	939

Source: San Luis Obispo County Planning and Building Dept., Assessor's Office, ParcelQuest, Wood Plc Parcel Analysis, CalFire





Figure I.4 Fire Hazard Severity Zones in Ground Squirrel Hollow Community Services District





I.4 Capability Assessment

Capabilities are the programs and policies currently in use to reduce hazard impacts or that could be used to implement hazard mitigation activities. This capability assessment is divided into five sections: regulatory mitigation capabilities, administrative and technical mitigation capabilities, fiscal mitigation capabilities, mitigation outreach and partnerships, and other mitigation efforts.

To develop this capability assessment, the jurisdictional planning representatives used a matrix of common mitigation activities to inventory which of these policies or programs were in place. The team then supplemented this inventory by reviewing additional existing policies, regulations, plans, and programs to determine if they contributed to reducing hazard-related losses.

During the plan update process, this inventory was reviewed by the jurisdictional planning representatives and Wood consultant team staff to update information where applicable and note ways in which these capabilities have improved or expanded. In summarizing current capabilities and identifying gaps, the jurisdictional planning representatives also considered their ability to expand or improve upon existing policies and programs as potential new mitigation strategies. The Ground Squirrel Hollow CSD capabilities are summarized below.

I.4.1 Regulatory Mitigation Capabilities

Table I.8 identifies existing regulatory capabilities the District has in place to help with future mitigation efforts. Note, many of the regulatory capabilities that can be used for the District are within the County's jurisdiction. Refer to Section 6 Capability Assessment of the Base Plan for specific information related to the County's mitigation capabilities.

Table I.8 Ground Squirrel Hollow CSD Regulatory Mitigation Capabilities

Regulatory Tool	Yes/No	Comments
General plan	Yes	County
Zoning ordinance	Yes	County
Subdivision ordinance	No	
Growth management ordinance	No	County has land use authority.
Floodplain ordinance	Yes	County
Other special purpose ordinance (stormwater, water conservation, wildfire)	No	
Building code	Yes	County
Fire department ISO rating	No	Refer to County Fire/Cal Fire.
Erosion or sediment control program	No	County may have authority for program.
Stormwater management program	No	County may have authority for program.
Site plan review requirements	Yes	County is supposed to refer development plans to us for review, but it almost never happens.
Capital improvements plan	Yes	We have a draft road system master plan, which we use as a guide for spending maintenance moneys.
Economic development plan	No	
Local emergency operations plan	Yes	County
Other special plans	Yes	Ground Squirrel Hollow Specific Plan
Flood Insurance Study or other engineering study for streams	Yes	County
Elevation certificates (for floodplain development)	Yes	County



Ground Squirrel Hollow does not participate separately in the National Flood Insurance Program (NFIP), nor is it required to, and does not have any mapped special flood hazard areas. Accordingly, there are no repetitive loss or severe repetitive loss properties, as defined by the NFIP, located within the District.

I.4.2 Administrative/Technical Mitigation Capabilities

Table I.9 identifies the District personnel responsible for activities related to mitigation and loss prevention.

Table I.9 Ground Squirrel Hollow CSD Administrative/Technical Mitigation Capabilities

Personnel Resources	Yes/No	Department/Position
Planner/engineer with knowledge of land development/land management practices	Yes	General Manager
Engineer/professional trained in construction practices related to buildings and/or infrastructure	Yes	General Manager
Planner/engineer/scientist with an understanding of natural hazards	Yes	General Manager
Personnel skilled in GIS	No	
Full time building official	No	
Floodplain manager	No	
Emergency manager	Sort of	Board President
Grant writer	Yes	General Manager
Other personnel	No	
GIS Data Resources (Hazard areas, critical facilities, land use, building footprints, etc.)	No	
Warning systems/services (Reverse 9-11, outdoor warning signals)	Yes	Signs, barricades, cones, sand stockpile, cold-mix asphalt stockpile

I.4.3 Fiscal Mitigation Capabilities

Table I.10 identifies financial tools or resources that the CSD could potentially use to help fund mitigation activities.

Table I.10 Ground Squirrel Hollow CSD Fiscal Mitigation Capabilities

Financial Resources	Accessible/Eligible to Use (Yes/No)
Community Development Block Grants	Yes
Capital improvements project funding	Yes
Authority to levy taxes for specific purposes	Yes
Fees for water, sewer, gas, or electric services	No
Impact fees for new development	Yes
Incur debt through general obligation bonds	Yes
Incur debt through special tax bonds	Yes
Incur debt through private activities	Yes
Withhold spending in hazard prone areas	No

I.4.4 Opportunities for Enhancement

Based on the capability assessment, the Ground Squirrel Hollow Community Services District has several existing mechanisms in place that help to mitigate hazards. There are also opportunities for the District to expand or improve on these policies and programs to further protect the community. Future improvements may include



providing training for staff members related to hazards or hazard mitigation grant funding in partnership with the County and Cal OES. Additional training opportunities will help to inform District staff and board members on how best to integrate hazard information and mitigation projects into the District policies and ongoing duties of the District. Continuing to train District staff on mitigation and the hazards that pose a risk to the Ground Squirrel Hollow Community Services District will lead to more informed staff members who can better communicate this information to the public.

I.5 Mitigation Strategy

I.5.1 Mitigation Goals and Objectives

The Ground Squirrel Hollow CSD adopts the hazard mitigation goals and objectives developed by the HMPC and described in Section 7 Mitigation Strategy of the Base Plan.

I.5.2 Mitigation Actions

The Planning Team for the Ground Squirrel Hollow Community Services District identified and prioritized the following mitigation actions based on the risk assessment. Background information and information on how each action will be implemented and administered, such as ideas for implementation, responsible office, potential funding, estimated cost, and timeline are also included. Actions with an '*' are those that mitigate losses to future development.

Due to limited resources and District responsibilities, the Ground Squirrel Hollow CSD has chosen not to mitigate against high wind at this time.





Table I.11 Ground Squirrel Hollow Community Services District's Mitigation Action Plan

ID	Hazard(s) Mitigated	Description/Background/Benefits	Lead Agency and Partners	Cost Estimate	Potential Funding	Priority	Timeline	Status/Implementation Notes
GSH. 1	Adverse Weather, Landslides and Debris Flow, Wildfire	Improve drainage on "Mud Corner" near 5661 Ground Squirrel Hollow Road to mitigate debris flow on road.	GSHCSD, with property owner and County	\$40-50,000	GSHCSD, Grants	High	2 Years	New A chronic problem during adverse weather due to debris flow from unstable soil on private property. GSHCSD will initiate dialog with property owner.
GSH. 2	Adverse Weather	Chip Seal Overlays to extend the life and strengthen chip seal roads during extreme heat and other adverse weather. This will also help support access from emergency vehicles needed for firefighting	GSHCSD, perhaps coop purchasing with County	\$300-400,000	Grants	Medium	5 Years	New GSHCSD does not generate sufficient funds.
GSH. 3	Adverse Weather, Landslides and Debris Flow, Wildfire	Implement road edge erosion control to mitigate undermining and failure of the road.	GSHCSD	Could be \$20,000 per year ongoing	GSHCSD, Grants	High	2 Years	New GSHCSD does some repair with available funding. Repairs are often needed after heavy weather when ruts form along the road edge. This project would reduce the need for periodic repairs.
GSH. 4	Wildfire	Implement "Replacement Financing" to build District funding capabilities for hazard mitigation and help ensure the District can maximize funding available for on-going maintenance of the road system.	GSHCSD	To be determined	US, State	Medium	5 years	New





ID	Hazard(s) Mitigated	Description/Background/Benefits	Lead Agency and Partners	Cost Estimate	Potential Funding	Priority	Timeline	Status/Implementation Notes
GSH. 5	Landslides and Debris Flow, Earthquake/Liquefaction, Wildfire	Mitigate landslide risk through improvements to the Stagg Hill Road edge cribbing.	GSHCSD	\$350,000	GSHCSD, Grants	Medium	10 Years	New There is a short section where the road edge is supported by timber cribbing with limited life remaining. Heavy vehicles and decaying wood could exacerbate the issue.
GSH. 6	Landslides and Debris Flow, Earthquake/Liquefaction, Wildfire	Build an emergency shelter with power generator and water well.	GSHCSD	\$500,000	GSHCSD, Grants	High	1-5 Years	New The District has an opportunity to purchase a parcel now for a dual-purpose community shelter and meeting room; will be pursued as available funding allows.





I.6 Implementation and Maintenance

Moving forward, the Ground Squirrel Hollow Community Services District will use the mitigation action table in the previous section to track progress on implementation of each project. Implementation of the plan overall is discussed in Section 8 in the Base Plan.

Incorporation into Existing Planning Mechanisms

The information contained within this plan, including results from the Vulnerability Assessment and the Mitigation Strategy, will be used by the District to help inform updates of the Ground Squirrel Hollow Community Plan and in the development of additional local plans, programs and policies. Understanding the hazards that pose a risk and the specific vulnerabilities to the jurisdiction will help in future capital improvement planning for the District. The County Planning and Building Department may utilize the hazard information when reviewing a site plan or other type of development applications with the boundaries of the Ground Squirrel Hollow Community Services District area. As noted in Section 8 Implementation and Monitoring the HMPC representatives from the Ground Squirrel Hollow Community Services District will report on efforts to integrate the hazard mitigation plan into local plans, programs and policies and will report on these efforts at the annual HMPC plan review meeting.

Monitoring, Evaluation and Updating the Plan

The Ground Squirrel Hollow Community Services District will follow the procedures to review and update this plan in accordance with San Luis Obispo County as outlined in Section 8 of the Base Plan. The CSD General Manager will be responsible for representing the Community Services District in the County HMPC, and for coordination with County staff and departments during plan updates. The Ground Squirrel Hollow Community Services District realizes it is important to review the plan regularly and update it every five years in accordance with the Disaster Mitigation Act Requirements as well as other State of California requirements.





J.1 District Profile

J.1.1 Mitigation Planning History and 2019 Process

This annex was created during the development of the 2019 San Luis Obispo County Hazard Mitigation Plan Update. The General Manager of the Heritage Ranch Community Services District (HRCSD) was the representative on the County-wide HMPC and took the lead for developing the plan and this annex in coordination with the HRCSD Planning Team. The HRCSD Planning Team will be responsible for implementation and maintenance of the plan. See Table J.1 for more information on the local Planning Team.

Table J.1 Heritage Ranch CSD Hazard Mitigation Plan Planning Team

Department or Stakeholder	Title
Heritage Ranch CSD	General Manager

More details on the planning process followed and how the jurisdictions, service districts and stakeholders participated can be found in Section 3 of the Base Plan (Planning Process), as well as how the public was involved during the 2019 update.

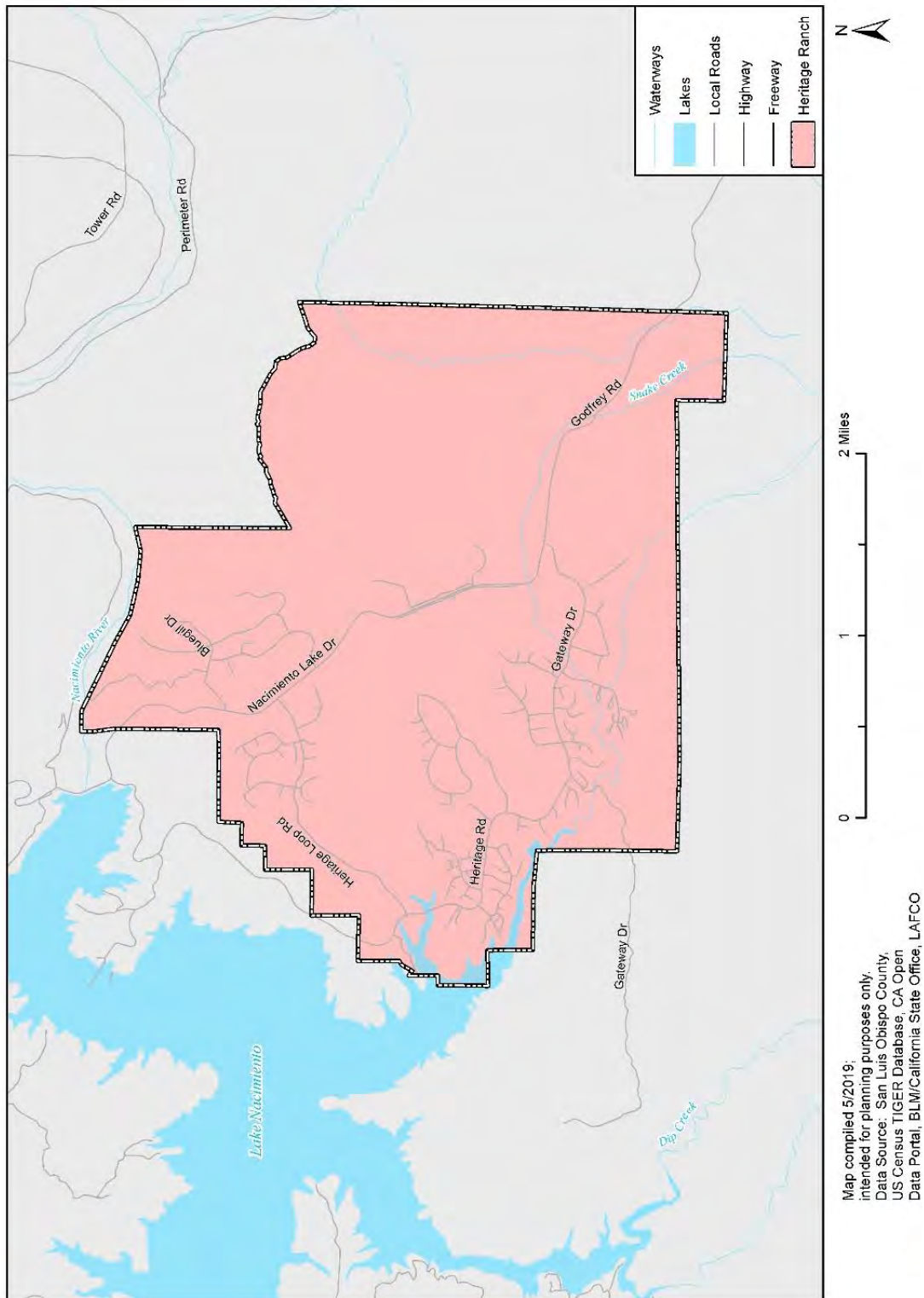
J.1.2 District Overview

The Village of Heritage Ranch was established in 1972 as a vacation and retirement community, and the Heritage Ranch Community Services District (HRCSD) was formed in 1990 to provide local control of water and sewer services. Heritage Ranch is located in the North County planning area and is one of two village reserve areas situated around Lake Nacimiento. The HRCSD service area is bounded on the west by Lake Nacimiento, on the north by the Nacimiento River, on the east by the Camp Roberts National Guard post, and on the south by private property. Figure J.1 shows the HRCSD boundaries, represented in pink.

The Village of Heritage Ranch includes both Heritage Ranch, a home and recreation community originally planned for 6,800 dwelling units, and Lake Nacimiento Resort, a complete resort facility with 1,500 campground spaces and day use facilities. The resort is privately owned on land leased from the Monterey County Water and Flood Control District. There is also a marina and campground, dude ranch, and recreation and equestrian centers.



Figure J.1 Heritage Ranch Community Services District





J.1.3 Development Trends

Future residential development is anticipated to continue to be oriented primarily toward construction of homes, but a modest continuing increase is expected in permanent residents, primarily the retired. Infrastructure improvements are being considered to accommodate the growing population of Heritage Ranch and increased recreational use of Lake Nacimiento. Because of existing concerns about overcrowding at Lake Nacimiento, the most current San Luis Obispo County Inland Area Plan recommends focusing on limiting current recreational use of the reservoir rather than accommodating expansion.

Rural refuse container stations have been recommended in the Inland Area Plan to mitigate illegal dumping in rural areas surrounding the Village of Heritage Ranch.

J.1.4 Other Community Planning Efforts

Coordination and synchronization with other community planning mechanisms and efforts are vital to the success of this plan. To have a thorough evaluation of hazard mitigation practices already in place, appropriate planning procedures should also involve identifying and reviewing existing plans, policies, regulations, codes, tools, and other actions are designed to reduce a community's risk and vulnerability from natural hazards.

As an unincorporated community, the Village of Heritage Ranch is referenced in other County planning documents and regulated by County policies and planning mechanisms. Integrating existing planning efforts, mitigation policies, and action strategies into this annex establishes a credible, comprehensive document that weaves the common threads of a community's values together. The development of this jurisdictional annex involved a comprehensive review of existing plans, studies, reports, and initiatives from San Luis Obispo County and the Village of Heritage Ranch community that relate to hazards or hazard mitigation. A high-level summary of the key plans, studies and reports can be found in Table J.2 below. Information on how they informed the update are noted and incorporated where applicable.

In addition to the development standards within the Heritage Ranch Specific Plan, there are County planning mechanisms that regulate future and existing development within the Village of Heritage Ranch planning area. Refer to subsection J.4 Capability Assessment as well as the Base Plan for more information on the plans, policies, regulations and staff that govern the Village of Heritage Ranch.

Table J.2 Summary of Review of Key Plans, Studies and Reports

Plan, Study, Report Name	How Document Informed the Annex
Heritage Ranch Village Plan (2014)	Pulled community background information as well as hazard details
North County Area Plan (2014)	Incorporated hazard information related to water supply
County of San Luis Obispo Local Hazard Mitigation Plan (2014)	Informed past hazard event history, hazard profile and background, and mitigation strategy information.
San Luis Obispo County 2014 Integrated Regional Water Management Plan	Obtained information on water use in the CSD, water management regions, and the drought/water scarcity hazard.
State of California's Hazard Mitigation Plan – Updated 2018	General information on hazards, events, and vulnerability assessments.
2014-2016 Resource Summary Report for San Luis Obispo County's General Plan	Pulled information about water resources, reliability, and ongoing efforts to increase resilience in the county and district of Heritage Ranch as related to drought.



J.2 Hazard Identification and Summary

The Heritage Ranch CSD planning team identified the hazards that affect the HRCSD and summarized their frequency of occurrence, spatial extent, potential magnitude, and significance specific to the HRCSD (see Table J.3). Note that the dam failure and dam incidents hazards will be combined in the description of this annex's loss estimation summaries, as they are in the Base Plan's Hazard Identification and Risk Assessment (HIRA). In addition, debris flows, and slope stability/landslide are related hazards that will be dealt with together in this annex (as they also were in the HIRA chapters of the Base Plan). Finally, hazardous trees are discussed within the adverse weather, drought, and wildfire chapters given these tree related issues are usually cascading from other natural events/hazards.

Table J.3 Heritage Ranch CSD Hazard Risk Summary

Hazard	Geographic Area	Probability of Future Occurrence	Magnitude/Severity (Extent)	Overall Significance
Adverse Weather	Extensive	Highly Likely	Critical	High
Dam Incidents	Extensive	Likely	Critical	High
Drought and Water Shortage	Extensive	Highly Likely	Critical	High
Earthquake	Extensive	Occasional	Catastrophic	High
Flooding	Extensive	Likely	Critical	High
Landslide/Debris Flow	Extensive	Likely	Negligible	High
Wildfire	Extensive	Highly Likely	Catastrophic	High
Geographic Area Limited: Less than 10% of planning area Significant: 10-50% of planning area Extensive: 50-100% of planning area Probability of Future Occurrences Highly Likely: Near 100% chance of occurrence in next year or happens every year. Likely: Between 10 and 100% chance of occurrence in next year or has a recurrence interval of 10 years or less. Occasional: Between 1 and 10% chance of occurrence in the next year or has a recurrence interval of 11 to 100 years. Unlikely: Less than 1% chance of occurrence in next 100 years or has a recurrence interval of greater than every 100 years.		Magnitude/Severity (Extent) Catastrophic—More than 50 percent of property severely damaged; shutdown of facilities for more than 30 days; and/or multiple deaths Critical—25-50 percent of property severely damaged; shutdown of facilities for at least two weeks; and/or injuries and/or illnesses result in permanent disability Limited—10-25 percent of property severely damaged; shutdown of facilities for more than a week; and/or injuries/illnesses treatable do not result in permanent disability Negligible—Less than 10 percent of property severely damaged, shutdown of facilities and services for less than 24 hours; and/or injuries/illnesses treatable with first aid Significance Low: minimal potential impact Medium: moderate potential impact High: widespread potential impact		



J.3 Vulnerability Assessment

The intent of this section is to assess the HRCSD vulnerability separate from that of the planning area, which has already been assessed in Section 5 Hazard Identification and Risk Assessment (HIRA) in the Base Plan. This vulnerability assessment analyzes the population, property, and other assets at risk to hazards ranked of medium or high significance.

The information to support the HIRA portion of this Annex was collected through a Data Collection Guide, which was distributed to each participating municipality or district to complete during the planning process.

Information collected was analyzed and summarized in order to identify and rank all the hazards that could impact anywhere within the County, as well as to rank the hazards and identify the related vulnerabilities unique to each jurisdiction/district. In addition, the Heritage Ranch CSD planning team members were asked to share information on past significant hazard events that have affected the HRCSD.

Each participating jurisdiction were in support of the main hazard summary identified in the Base Plan (See Section 5 of the Base Plan). However, the hazard summary rankings for each jurisdictional annex may vary slightly due to specific hazard risk and vulnerabilities unique to that jurisdiction (See Table J.3). Identifying these differences helps the reader to differentiate the jurisdiction's risk and vulnerabilities from that of the overall County.

Note: The hazard "significance" reflects overall ranking for each hazard and is based on the Heritage Ranch CSD planning team input from the Data Collection Guide and the risk assessment results compiled during the planning process (see Section 5 of the Base Plan), which included more detailed quantitative analyses with best available data. The hazard summaries in Table J.3 reflect the hazards that could potentially affect the HRCSD. The discussion of vulnerability for each of the hazards listed is in subsection J.3.2 Estimating Potential Losses.

Other Hazards

The HRCSD rated hazardous trees as a high significance hazard. In terms of this plan hazardous trees are considered a cascading hazard for adverse weather, drought and wildfire hazards. Information related to the public concerns about tree mortality in relation to wildfire risk can be found under J.3.2 Estimating Potential Losses and in Section 5 of the Base Plan.

Additionally, the HRCSD Planning Committee members decided to rate several hazards as Not Applicable (N/A) to the planning area due to a lack of exposure, vulnerability, and no probability of occurrence. The following hazards are considered Not Applicable (N/A) to the Heritage Ranch Community Services District.

- Agricultural Pest Infestation and Disease
- Biological Agents (naturally occurring)
- Coastal Storm/Coastal Erosion/Sea Level Rise
- Subsidence
- Tsunami and Seiche
- Hazardous Materials

J.3.1 Assets at Risk

This section considers assets at risk within the District and Village of Heritage Ranch, including values at risk, critical facilities and infrastructure, historic assets, economic assets, and growth and development trends. See subsection 5.2 of the Base Plan for more details and background on the parcel summarization, analysis, and datasets available.





Values at Risk

The following data on property exposure is derived from San Luis Obispo County Assessor data. This data should only be used as a guideline to overall values in the Community Services District as the information has some limitations. Table J.4 summarizes the exposure of properties (e.g., the values at risk based on improvement values, content values, and total values as an addition of these two types of values) broken down by property type for the Heritage Ranch Community Services District.

Table J.4 Property Exposure for Heritage Ranch by Property Types

Property Type	Property Count	Improved Value	Content Value	Total Value
Commercial	1	\$6,498,416	\$6,498,416	\$12,996,832
Government/Utilities	9	--	--	--
Other/Exempt/Miscellaneous	313	\$2,060,342	--	\$2,060,342
Residential	937	\$223,625,509	\$111,812,755	\$335,438,264
Multi-Family Residential	78	\$10,113,042	\$5,056,521	\$15,169,563
Mobile/Manufactured Homes	676	\$62,511,623	\$31,255,812	\$93,767,435
Vacant	10	\$1,767,486	--	\$1,767,486
Total	2,024	\$306,576,418	\$154,623,503	\$461,199,921

Source: Wood Plc summaries based on ParcelQuest and San Luis Obispo County Assessor's Office data, 2019

Critical Facilities and Infrastructure

A critical facility is defined as one that is essential in providing utility or direction either during the response to an emergency or during the recovery operation. See Section 5 of the Base Plan for more details on the definitions and categories of critical facilities.

An inventory of critical facilities in the Heritage Ranch Community Services District based on San Luis Obispo County GIS data as well as structures obtained from the Homeland Infrastructure Foundation-Level Dataset (HIFLD) is provided in in Table J.5 and illustrated in Figure J.2. The four types of Critical Facilities categorized by San Luis Obispo County and its jurisdictions' and districts' planning teams are: Emergency Services, High Potential Loss Facilities, Lifeline Utility Systems, and Transportation Systems. Note that Heritage Ranch has only identified critical facilities falling under the one category listed below. Refer to subsection 5.2 of the Base Plan for more information on the Assets used throughout this annex and the county-wide analyses.

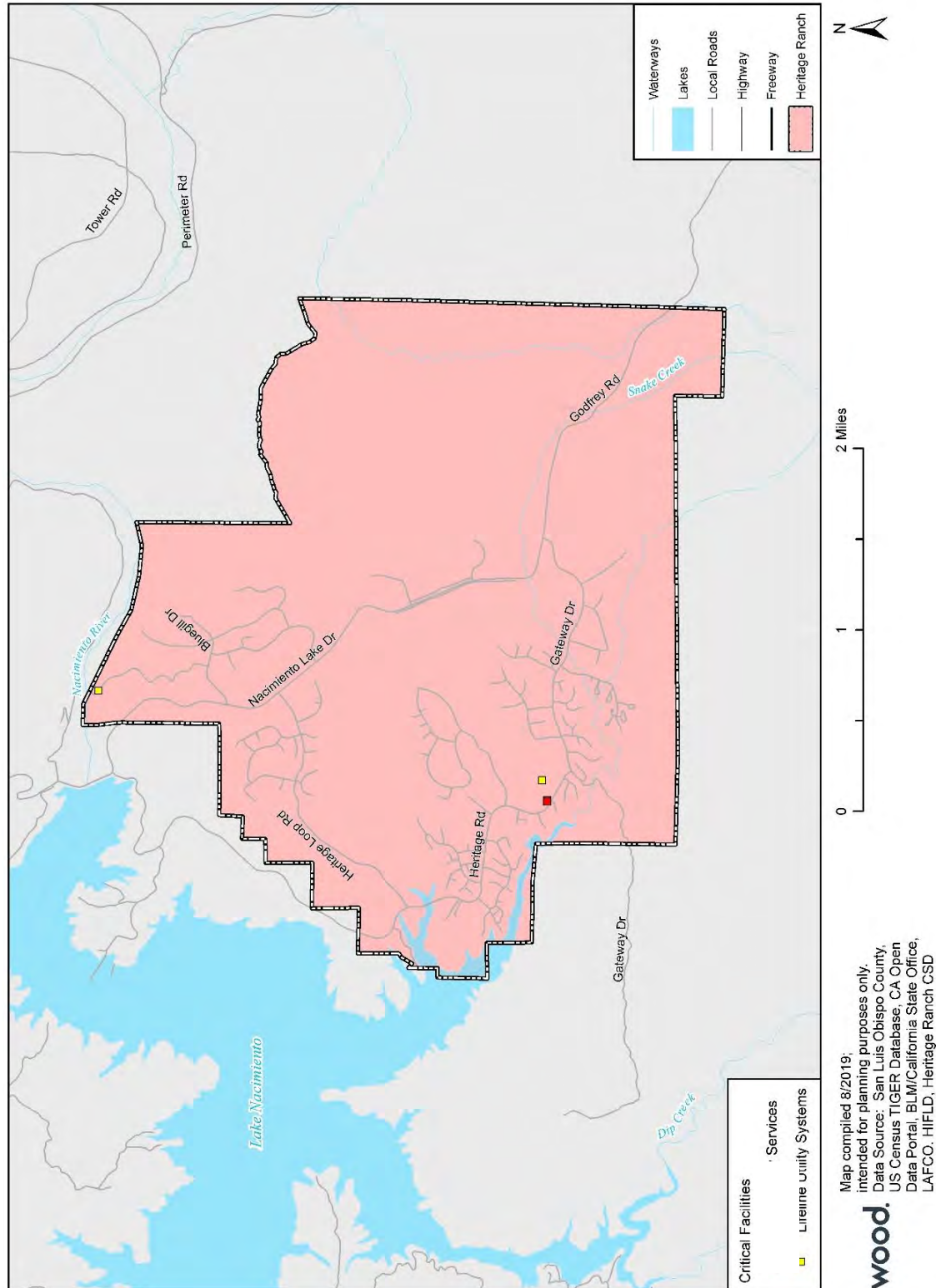
Table J.5 Heritage Ranch Critical Facilities

Facility Category	Facility Type	Name	Counts
Emergency Services	Emergency Medical Service Stations	California Department of Forestry and Fire Protection Station 33 - Heritage Ranch Fire Station	1
	Fire Stations		1
Lifeline Utility Systems	Water Treatment Facilities	Heritage Ranch CSD Water Treatment Plant	1
	Wastewater Treatment Plants	Heritage Ranch CSD Wastewater Treatment Plant, Operations Yard, and Administrative Building	1
Total			4

Source: San Luis Obispo County Planning & Building, Heritage Ranch CSD, HIFLD



Figure J.2 Heritage Ranch Critical Facilities





Additional Critical Facilities

Additional critical facilities as identified by the Heritage Ranch CSD Planning Team are as follows:

- Water Treatment and Distribution System - \$18.1 million replacement value
- Wastewater Collection and Treatment System - \$11.8 million replacement value
- Administration Building - \$675,000 replacement value

Emergency Service Facilities

The CSD contains 2 Emergency Services facilities aimed at providing for the health and welfare of the entire community. It is technically one fire station that serves the two purposes of providing fire protection and firefighting capabilities as well as emergency medical services, as stated in Table J.5.

Transportation Systems, High Potential Loss Facilities, and Lifeline Facilities

No critical transportation systems were specifically identified in the District, nor were high potential loss facilities. However, two lifeline facilities were noted, one of which is the Heritage Ranch CSD Water Treatment Plant and the other a combination facility containing the Heritage Ranch CSD Wastewater Treatment Plant, the Operations Yard, and the Administrative Building. In addition, it is worth noting that the Village of Heritage Ranch is only accessible via Lake Nacimiento Drive, which links to Highway 101 (a notable transportation route) at two locations. If development occurs to the levels projected for the Village of Heritage Ranch and nearby communities, traffic levels could far exceed the roadway capacity. Upgrades to Lake Nacimiento Drive have been proposed, as has a new collector road that would encircle Lake Nacimiento, passing through the Village of Heritage Ranch and nearby communities.

The only source of potable water for HRCSD is the Nacimiento Reservoir that is dammed by the Nacimiento Dam, which hence impounds Lake Nacimiento. The Monterey County Water Resources Agency (MCWRA) operates the dam (also worth noting as an important facility for the District) for flood protection and water distribution. The HRCSD water treatment facility is located about ¼ mile downstream of the dam and receives water via three shallow infiltration gallery wells several feet under the bed of the Nacimiento River. Native material and engineered bedding above and around the gallery wells provide some natural turbidity reduction, which is further reduced by a plate settler before water is processed through sand filters.

Historic and Cultural Resources

Historical assets include local, county, state, and potentially federally listed historic sites. Based on data provided by the County of San Luis Obispo and LAFCO, it was found that there are no historic and cultural resources in or near the Heritage Ranch CSD.

Natural Resources

Natural resources are important to include in benefit-cost analyses for future projects and may be used to leverage additional funding for projects that also contribute to community goals for protecting sensitive natural resources. Awareness of natural assets can lead to opportunities for meeting multiple objectives. For instance, protecting wetlands areas protects sensitive habitat as well as attenuates and stores floodwaters. The Heritage Ranch Village Plan (2014) designated the following combining designations that apply to the protection of special resources in the Heritage Ranch community:

- Nacimiento River and Canyon; Dip, Franklin, Las Tablas, Snake and Town Creeks; and Lake Nacimiento – These water courses are identified as susceptible to potential flood hazards. Future development proposals must incorporate mitigation measures. All are natural drainage courses which should be maintained in their





natural state with native vegetation and habitats retained. At Lake Nacimiento, the 800-foot elevation constitutes the lake's high-water level and no habitable structures are permitted below the 825-foot elevation.

- The Santa Lucia Range and Foothill Areas – Portions of this Geologic Study Area (GSA) are exposed to moderately high and high landslide risk potential.
- Lake Nacimiento Drive Interlake Road – The portion of this route from Chimney Rock Road northwest to the Monterey County line is an adopted State scenic highway route. All development in this corridor must be sited to minimize visual impacts as this interlake road was classified as a Sensitive Resource Area.

Economic Assets

According to the Inland Area Plan, prior to the creation of Lake Nacimiento, the population of the sub-area was widely dispersed with most residing and employed on farms and ranches. Despite the rugged terrain of most of the area and the concentration of recreational activities at the lake, the economy of the region surrounding Lake Nacimiento remains agriculture based. Grazing is the primary agricultural pursuit, though some dry farming occurs in limited areas. Commercial activities around the lake are mostly visitor-serving and oriented toward peak use periods.

J.3.2 Estimating Potential Losses

Note: This section details vulnerability to specific hazards of high or medium significance, where quantifiable, and/or where (according to Planning Team input) it significantly differs from that of the overall County.

Table J.4 under subsection J.3.1 summarizes the Village of Heritage Ranch's exposure in terms of number and value of parcels falling within the District's boundaries. San Luis Obispo County's parcel and assessor data was used to calculate the improved value of parcels, using ParcelQuest's spatial layers on parcel geometry. The most vulnerable structures are those in the parcels within hazard threat areas, unreinforced masonry buildings, and buildings built prior to the introduction of modern-day building or land regulatory codes. Impacts of past events and vulnerability to specific hazards are further discussed below as particular to each hazard. See Section 5 of the Base Plan for more information on assets, parcel analysis methodology, and hazard profiles.

Adverse Weather

Adverse weather for the Village of Heritage Ranch includes thunderstorms, heavy rain, hail, lightning, dense fog, freeze, high winds, tornadoes, and extreme heat depending on the time of year. This hazard has been identified as posing **High Significance** for HRCSD. Common problems associated with severe storms include the loss of utilities or immobility. Loss of life is uncommon but can occur during severe storms depending on secondary effects or impacts. Immobility can occur when roads become impassable due to dense fog, heavy rains causing flooding, and downed trees (often referred to as hazardous trees due to the threat they pose).

Being in the northern portion of the county, the Village of Heritage Ranch experiences heavier rainfall compared to the southern portion of the county. Climate change is expected to further increase rainfall in winter months, while decreasing rainfall in spring months. A changing climate will also likely lead to more extreme temperatures, particularly hotter weather in the warmer months. Heavy rain may lead to more debris flows and landslides, as well as erosion and flash or localized flooding, especially over areas that have been impacted by wildfire or other hazards affecting the local landscape. See the Landslide section below for more on this related hazard. Increased seasonal variability in precipitation will likely have an impact on releases from the Nacimiento Dam as well. The potential for downed trees is also a significant concern of the community. Section 5 of the Base Plan contains additional information on past adverse weather events in San Luis Obispo County and the Village of Heritage Ranch/Nacimiento Area.





Dam Incidents

Dam incidents are classified as **Highly Significant** for the HRCSD. See Figure J.3 for areas at risk of inundation from the Nacimiento Dam if it were to fail. The Nacimiento Dam is managed by Monterey County. Though total failure is unlikely, several damaging release incidents have occurred. In 1969, 2006, 2011, and 2017, heavy rain caused Lake Nacimiento to fill to capacity, prompting Monterey County Water Resources Agency (MCWRA) to lower the spillway, dramatically increasing flows downstream. The 1969 release damaged downstream property and would have destroyed the HRCSD water treatment facility had it existed at the time.

The 2011 release of the Nacimiento Dam increased flows downstream from 400 to 8,100 cubic feet per second (cfs) in less than three hours with sustained flow over 6,000 cfs. This destroyed the HRCSD gallery well system, requiring emergency repairs to be made at a cost of approximately \$375,000. The new gallery wells were lowered three feet, but the system was still incapable of handling flows over 5,000 cfs and was damaged again by releases in 2017. Flows over 5,000 cfs are highly likely to occur in the future according to MCWRA. If the gallery well system cannot be maintained, the water treatment facility will need to be converted to a conventional water treatment plant or receive water through a different intake method. Photos of the Nacimiento Dam uncontrolled releases, spills, and failures are included in Figure J.4 below.

To alleviate the issues that have occurred in the past with the dam, and because the Nacimiento Reservoir (with water controlled by the Nacimiento Dam) is the only source of potable the HRCSD, a few goals were set by the Planning Team related to dam failure and dam incident:

- Continue actively engaging with the MCWRA to operate the Nacimiento Dam in a manner more conducive to preventing dam related hazards
- Construction of a vertical well or wells to provide mitigation for both low and high flows related to this and drought hazards.





Figure J.3 Dam Inundation Extents in the Heritage Ranch CSD

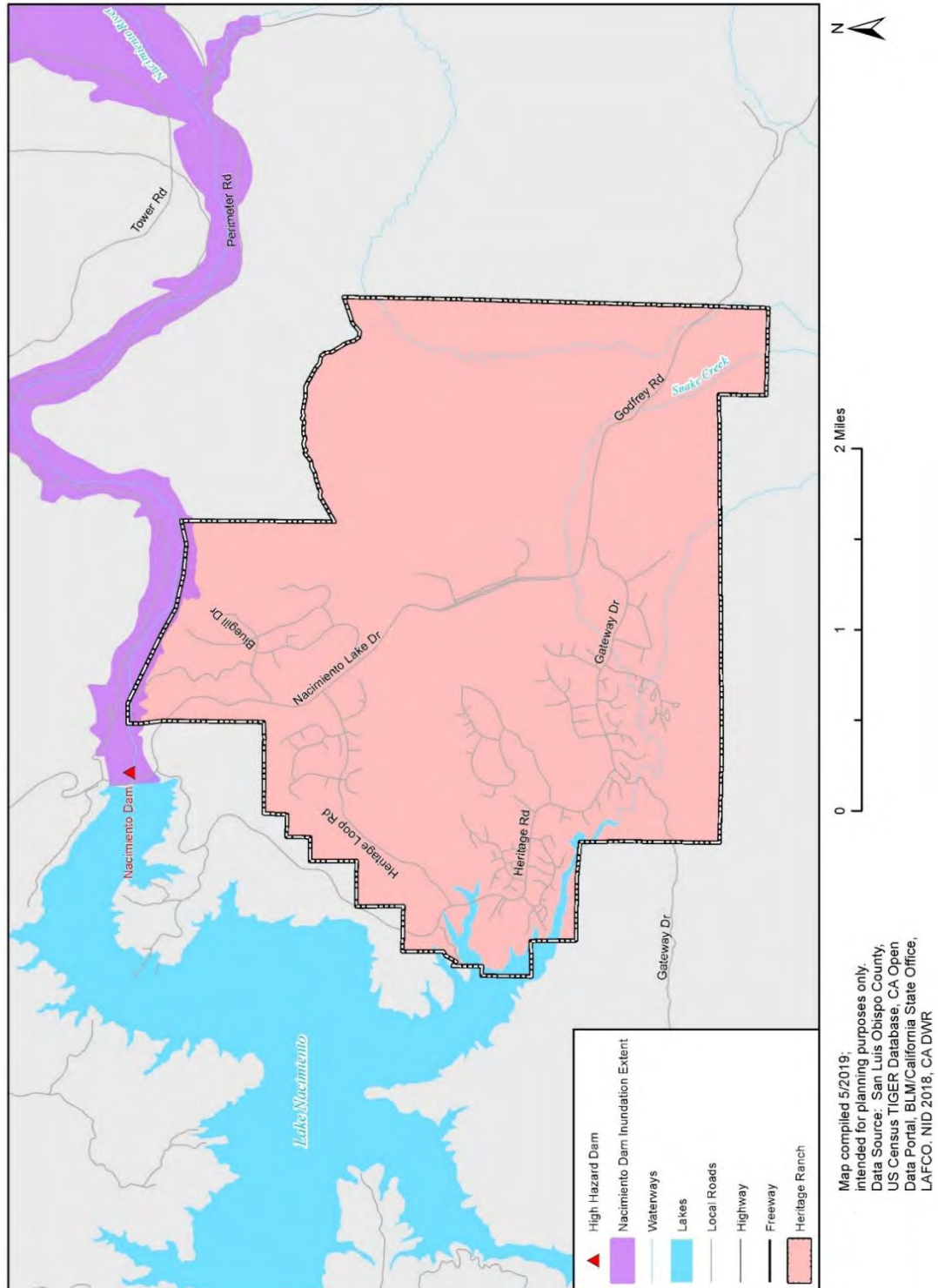


Figure J.4 Nacimiento Dam Incidents throughout the Years



Source: Heritage Ranch CSD Planning Team, 2019



Structures and Population at Risk

A dam inundation vulnerability assessment was completed during the update of the county hazard mitigation plan, following the methodology described in Section 5 of the Base Plan. Dam inundation extents were overlaid with parcels falling within the HRCSD boundary with use of GIS, and the results of the analysis indicate that only one parcel is found to overlap with the dam inundation extent layer from the Nacimiento Dam, and no population is at risk from this parcel (as no people are likely to reside in a government/utilities property).

Table J.6 Heritage Ranch CSD's Parcels within the Nacimiento Dam Inundation Extents

Parcel Type	Parcel Count	Improved Value	Content Value	Total Value	Loss Estimate	Population at Risk
Government/Utilities	1	--	--	\$0	\$0	--
Total	1	\$0	\$0	\$0	\$0	--

Source: San Luis Obispo County Planning and Building Dept., Assessor's Office, ParcelQuest, Wood Plc Parcel Analysis, CA DWR, NID 2018

Critical Facilities at Risk

Based on the GIS analysis performed there is 1 critical facility located in the dam inundation areas affecting the Heritage Ranch CSD (from the Nacimiento Dam). This is the Heritage Ranch CSD Water Treatment Plant, located on the northwest corner of the CSD's boundary, at 10200 Nacimiento Lake Drive.

Drought and Water Shortage

San Luis Obispo County has an annual entitlement to 17,500 acre-feet of water from Lake Nacimiento, of which HRCSD is currently under contract with San Luis Obispo County for 889 acre-feet. Overall, San Luis Obispo County has set aside a maximum allotment of 1,100 acre-feet for the area encompassed by HRCSD. The 2014 Village Plan recommended that a moratorium on further development be enacted if total water use in the Village of Heritage Ranch reaches this limit.

HRCSD has experienced severe drought for the past few years except. Drought conditions have increased water treatment costs due to many things including but not limited to rapid changes in water levels in Lake Nacimiento. Since the dam was constructed, the water elevation in the reservoir has never reached "dead pool" conditions in which the water elevation is below the elevation of the outlet works, so that no water flows downstream. However, multi-year drought periods have lowered the water elevation close to this point. In 2016 HRCSD constructed an emergency intertie with the Nacimiento Water Project to allow for water intake in dead pool conditions or other times when water cannot be released through the dam outlet works. A recycled water study was also completed in 2017 to evaluate water and wastewater treatment and determine the feasibility of recycled water usage. HRCSD also imposes water restrictions in times of drought. Because of the rapid rate at which Nacimiento Reservoir's water elevations are changing, increased costs have also been seen for water treatment.

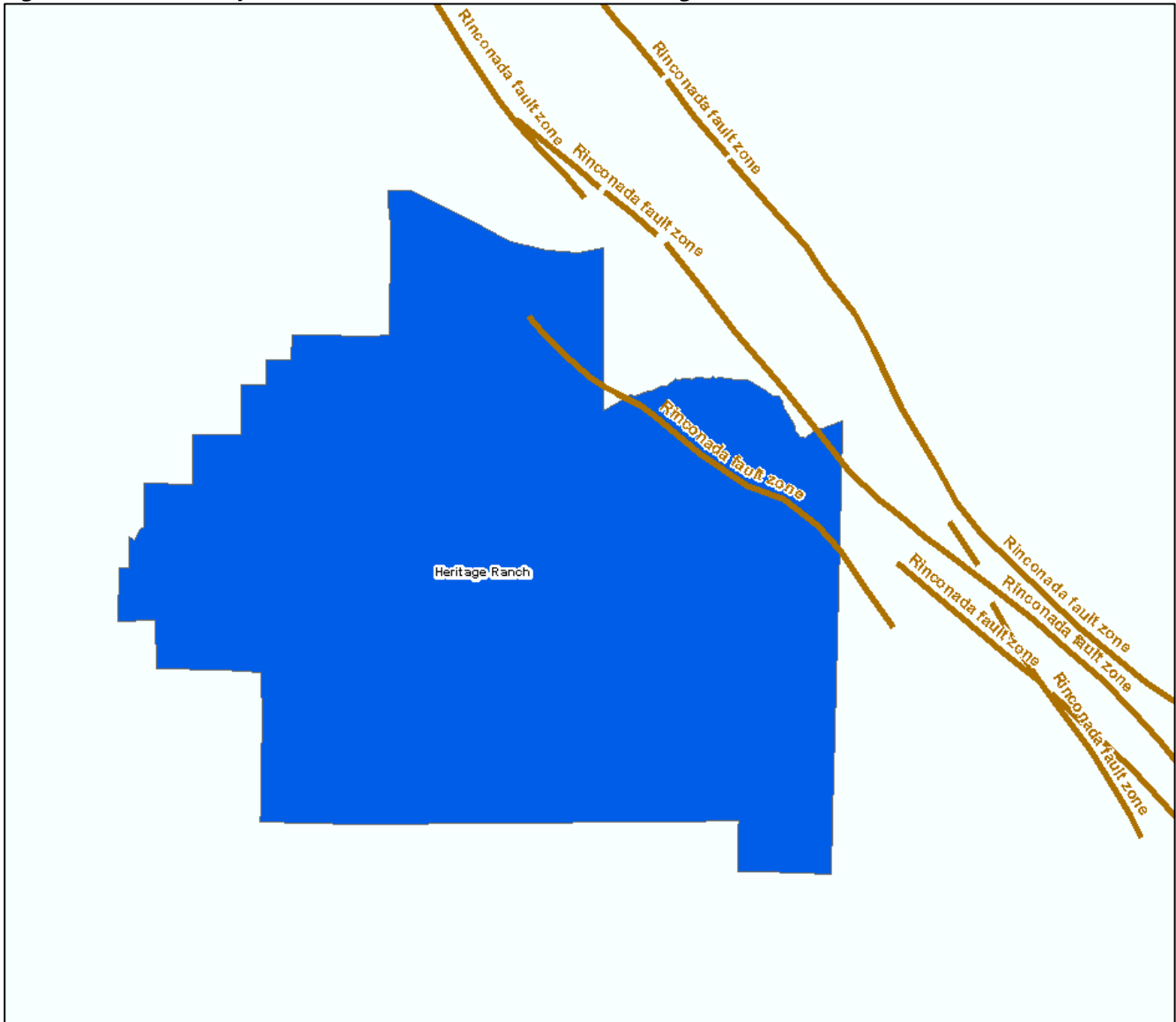
This drought hazard, along with adverse weather conditions, was deemed a likely contributing factor to the very destructive 2016 Chimney Fire, which is described in the Wildfire section of this annex. As a related drought impact, tree mortality has resulted in potentially vulnerable critical infrastructure property as these vulnerable trees become more susceptible to falling with time and could affect properties in the planning area. Drought and water shortage hazards have been identified as posing **High Significance** for the Heritage Ranch CSD.



Earthquake

The nearest fault zone to Heritage Ranch is the Rinconada fault zone (see the snapshot in Figure J.5). This regional fault zone is considered to be potentially active and has moderate ground shaking potential. The structure most vulnerable to an earthquake in Heritage Ranch is the Nacimiento Dam which is about three miles from the fault.

Figure J.5 Earthquake Fault Zones in and near the Heritage Ranch CSD



Source: USGS, San Luis Obispo County Planning & Building, LAFCO, Wood Plc analysis

Failure of the dam due to future seismic activity could inundate a small portion of the community and perhaps heavily damage or even destroy the HRCSD water intake system and water treatment plant, eliminating the HRCSD ability to provide safe drinking water to its residents. In addition, seiches could be an issue nearby





because of the Lake, which could cause flooding of the community and nearby structures, properties, and facilities. No moderate, high, or very high liquefaction risk has been identified to be present inside the District. However, high liquefaction risk zones are present to the north of the community, following the Nacimiento River's path. The two critical facilities listed in subsection J.3.1 of this annex are found in low liquefaction risk areas.

For more information on Earthquakes and Liquefaction, refer to subsection 5.3.10 of the Base Plan. For information on Tsunami and Seiche hazards, see subsection 5.3.14. Overall, the earthquake hazard has been identified as posing **High Significance** for the Heritage Ranch CSD.

Flooding

Lake Nacimiento, the Nacimiento River, and its associated tributaries have been identified as posing flood hazards. The 2011 dam incident caused significant flooding of the Nacimiento River below the dam. Three to four feet of riverbed material was removed in this incident, blocking some channels and scouring others. This "re-carving" of the channel will likely impact the way future flows are routed through the river. Overall, flood hazards have been identified as posing **High Significance** for the Heritage Ranch CSD.

Heritage Ranch does not participate separately in the National Flood Insurance Program (NFIP) but will continue to support the County's participation in and compliance with the NFIP.

Structures and Population at Risk

A flood vulnerability assessment was completed during the update of the county hazard mitigation plan, following the methodology described in Section 5 of the Base Plan. Table J.7 below summarizes the values at risk in the Village of Heritage Ranch 100-year floodplain (which corresponds to 1% chance of flooding in a 100-year period). Based on this analysis, the Village of Heritage Ranch has only one parcel at risk of flooding in a 100-year event.

Table J.7 Village of Heritage Ranch FEMA 1% Annual Chance Flood Hazard by Property Type

Property Type	Parcel Count	Improved Value	Content Value	Total Value	Loss Estimate	Population at Risk
Other/Exempt/Miscellaneous	1	--	--	\$0	\$0	--
Total	1	\$0	\$0	\$0	\$0	--

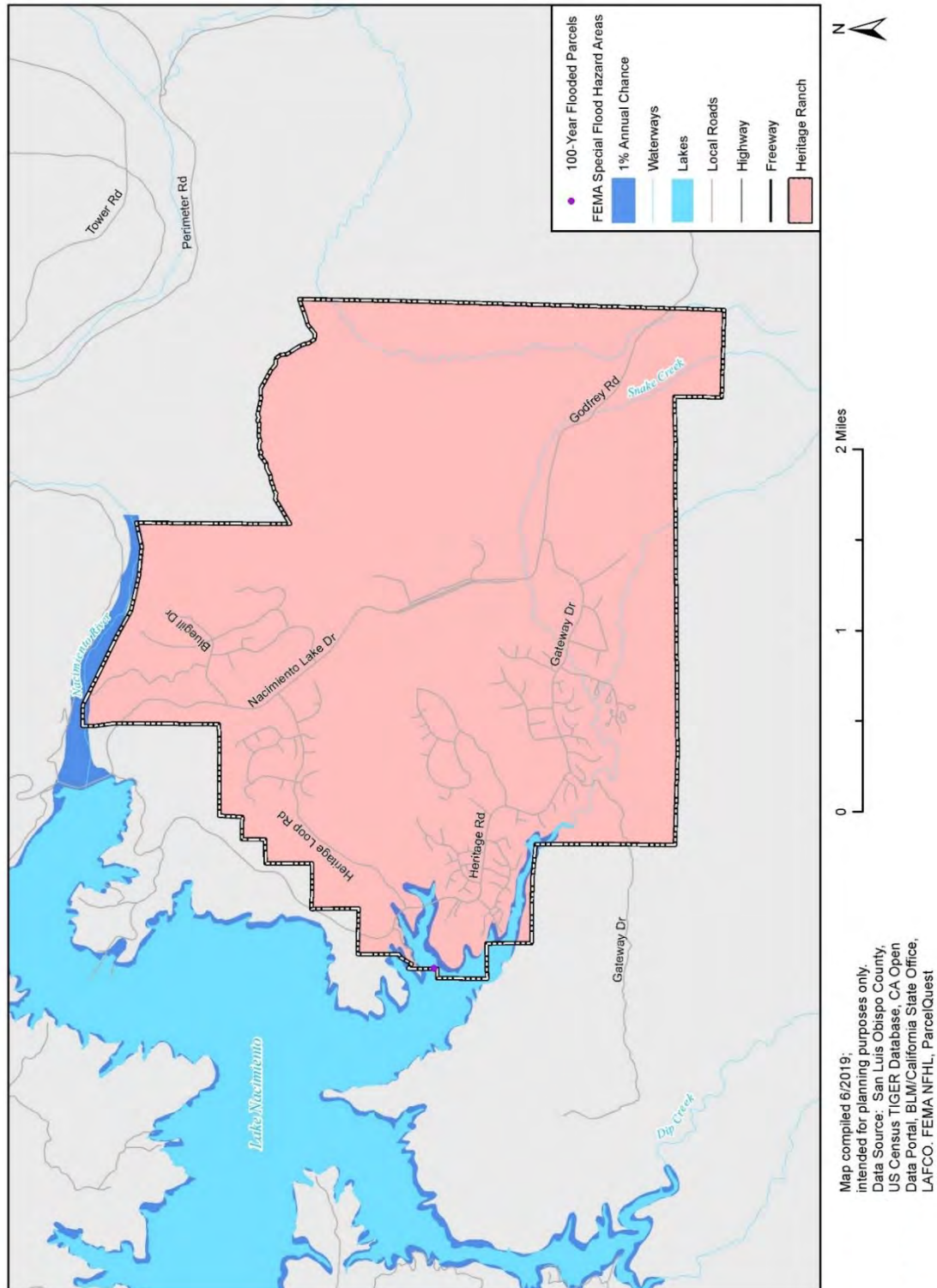
Source: San Luis Obispo County Planning and Building Dept., Assessor's Office, ParcelQuest, Wood Plc Parcel Analysis, FEMA NFHL

Limitations to the analysis performed and results shown: This model may include structures in the floodplains that are elevated at or above the level of the base-flood elevation, which will likely mitigate flood damage.

Figure J.6 displays the parcel flooded by the 100-year event, located on the west side of the district, shown as a purple dot. No population is at risk of flooding from this parcel (as no people are likely to reside in an exempt or miscellaneous property). The Heritage Ranch planning team also noted that the CSD's intake facilities and water treatment facility properties are located approximately where the red square is on Figure J.6, towards the northwest of the CSD boundary. No 500-year floodplains have been identified.



Figure J.6 **Flooded Parcel in the Village of Heritage Ranch, in the 100-Year Floodplain**





Critical Facilities at Risk

Based on the GIS analysis performed there are no critical facilities located in the 100-year or 500-year flood hazard areas, though the Heritage Ranch CSD's Water Treatment Facility is located in the dam inundation extent of the Nacimiento Dam (see the Dam Incidents section of this document for additional details).

Landslides and Debris Flow

Landslide potential and debris flow hazards have been ranked by the Planning Team as posing **High Significance** to the Heritage Ranch CSD.

Heavy rain in the year following the Chimney Fire of 2016 led to a significant debris flow into Lake Nacimiento/Nacimiento Reservoir. This degraded the quality of water entering the HRCSD water treatment facilities, thus increasing treatment costs which is of high importance as the Nacimiento Reservoir water is the only source of potable water for the community. Such debris flows can also add stress to the dam and require costly removal of sediment and debris. A similar debris flow is highly likely to occur in the future, as is a landslide. Tables J.8, J.9, and J.10 summarize the parcel values in zones of moderate, high, and extremely high landslide potential, respectively. Most properties exist in areas of moderate landslide potential. A total of 678 parcels are hence at risk of landslide hazards, with a total estimated value of over \$168 million at risk. Figure J.7 displays the landslide potential areas present in and near the Village of Heritage Ranch.

Structures at Risk

A vulnerability assessment was completed during the update of the county hazard mitigation plan, following the methodology described in Section 5 of the Base Plan. Landslide potential was determined for the Village of Heritage Ranch by overlaying the county's parcel layers with the landslide potential zones, all in GIS.

Critical Facilities at Risk

Based on the GIS analysis performed there is 1 critical facility located in the Moderate landslide potential area: The Heritage Ranch CSD Water Treatment Plant on the northwest of the CSD, at 10200 Nacimiento Lake Dr.

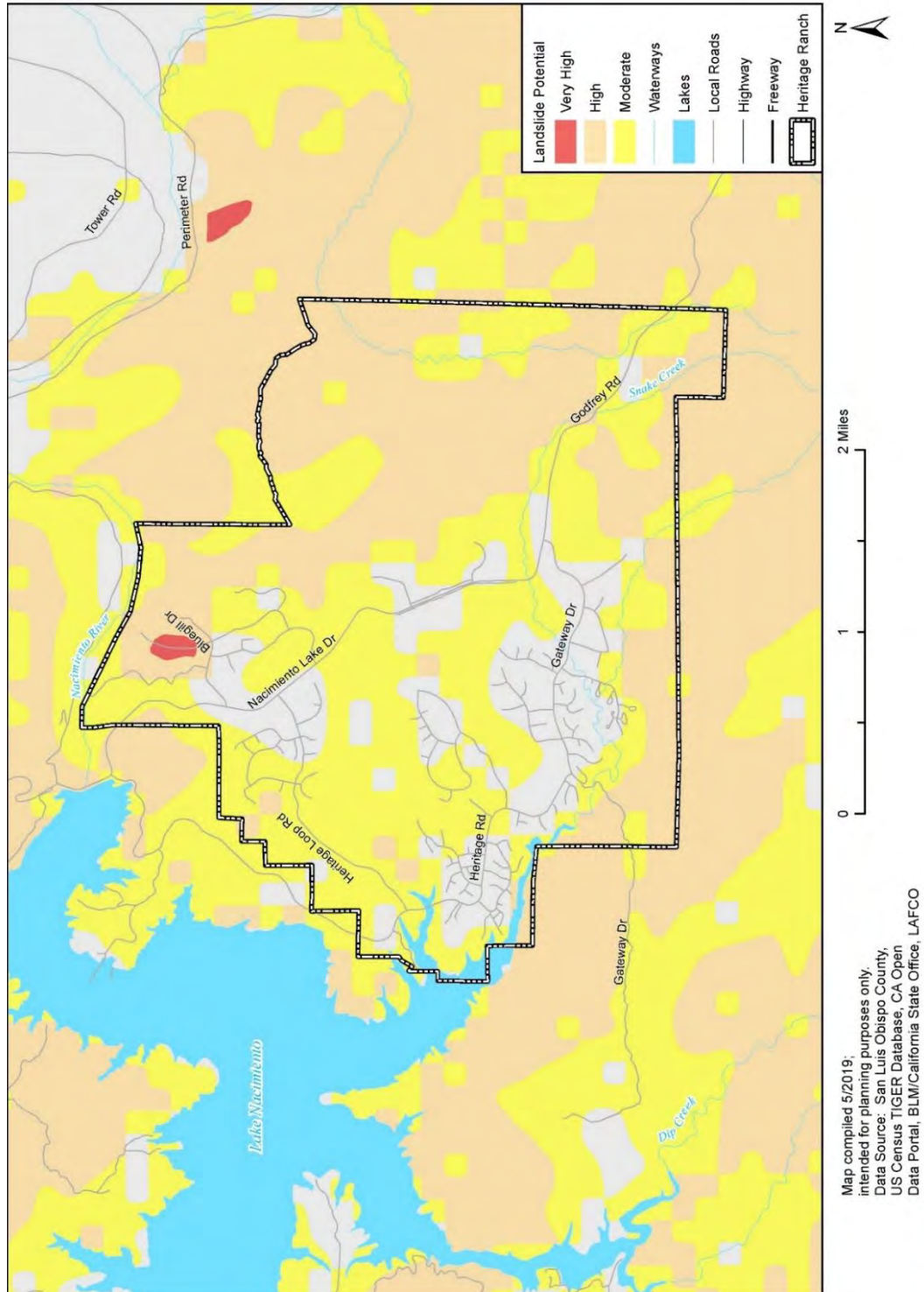
Table J.8 The Village of Heritage Ranch Parcels in Moderate Landslide Potential by Parcel Type

Property Type	Property Count	Improved Value	Content Value	Total Value
Government/Utilities	3	--	--	\$0
Other/Exempt/Misc.	129	\$1,002,358	--	\$1,002,358
Residential	215	\$69,560,773	\$34,780,387	\$104,341,160
Multi-Family Residential	40	\$4,157,490	\$2,078,745	\$6,236,235
Mobile/Manufactured Homes	224	\$21,299,268	\$10,649,634	\$31,948,902
Vacant	3	\$635,903	--	\$635,903
Total	614	\$96,655,792	\$47,508,766	\$144,164,558

Source: San Luis Obispo County Planning and Building Dept., Assessor's Office, ParcelQuest, Wood Plc Parcel Analysis



Figure J.7 Landslide Potential Hazard Areas in the Village of Heritage Ranch



**Table J.9 The Village of Heritage Ranch Parcels in High Landslide Potential by Parcel Type**

Property Type	Property Count	Improved Value	Content Value	Total Value
Government/Utilities	2	--	--	\$0
Other/Exempt/Misc.	10	--	--	\$0
Residential	25	\$10,199,896	\$5,099,948	\$15,299,844
Mobile/Manufactured Homes	10	\$826,489	\$413,245	\$1,239,734
Total	47	\$11,026,385	\$5,513,193	\$16,539,578

Source: San Luis Obispo County Planning and Building Dept., Assessor's Office, ParcelQuest, Wood Plc Parcel Analysis

Table J.10 The Village of Heritage Ranch Parcels in Very High Landslide Risk by Parcels Type

Property Type	Property Count	Improved Value	Content Value	Total Value
Other/Exempt/Misc.	3	--	--	\$0
Residential	14	\$5,012,952	\$2,506,476	\$7,519,428
Total	17	\$5,012,952	\$2,506,476	\$7,519,428

Source: San Luis Obispo County Planning and Building Dept., Assessor's Office, ParcelQuest, Wood Plc Parcel Analysis

Wildfire

According to the Heritage Ranch Village Plan from 2014, because of the dry summer climate coupled with highly flammable vegetation (including hazardous trees that were flammable or downed and hence dangerous) as well as rugged terrain, fire hazard in Heritage Ranch is high, and fire control is difficult. The Chimney Fire in 2016 injured one person, destroyed 49 residences and 21 other structures, and damaged 8 structures. Drought contributed to this fire which was caused by the ignition of dry grass adjacent to a dirt road. Increased recreation uses will likely intensify the fire hazard in developed areas as well as along the miles of Lake Nacimiento's shoreline accessible by boat. Wildfire hazards have been ranked by the Planning Team as posing **High Significance**. Figure J.8 depicts the fire hazard severity zones under which the Heritage Ranch CSD falls.

Structures and Population at Risk

A wildfire vulnerability assessment was completed during the update of the county hazard mitigation plan, following the methodology described in Section 5 of the Base Plan. Risk of wildfire was determined for the Heritage Ranch CSD by overlaying the parcel layers with the fire hazard severity zones within the California State Responsibility Areas (SRAs), all in GIS. Table J.11 and Table J.12 summarize the parcel values found within moderate and very high fire hazard severity zones, respectively, as no parcels fall within the high wildfire hazard severity zones in the district. Most properties in the Village of Heritage Ranch are located in a zone of very high fire hazard severity. While no people are expected to be at risk of the moderate severity SRA zones (based on the likelihood that no people reside in exempt or miscellaneous properties), a total of 4,244 people are at risk of being affected by fires, as they are located in very high fire hazard severity zones.

**Table J.11 The Village of Heritage Ranch Wildfire Risk by Property Type – Moderate Severity SRA Zone**

Property Type	Property Count	Improved Value	Content Value	Total Value	Loss Estimate	Population
Other/Exempt/Miscellaneous	1	--	--	\$0	\$0	--
Total	1	\$0	\$0	\$0	\$0	--

Source: San Luis Obispo County Planning and Building Dept., Assessor's Office, ParcelQuest, Wood Plc Parcel Analysis, CalFire

Table J.12 The Village of Heritage Ranch Wildfire Risk by Property Type – Very High Severity SRA Zone

Property Type	Property Count	Improved Value	Content Value	Total Value	Loss Estimate	Population
Commercial	1	\$6,498,416	\$6,498,416	\$12,996,832	\$12,996,832	--
Government/Utilities	9	--	--	\$0	\$0	--
Other/Exempt/Miscellaneous	312	\$2,060,342	--	\$2,060,342	\$2,060,342	--
Residential	937	\$223,625,509	\$111,812,755	\$335,438,264	\$335,438,264	2,352
Multi-Family Residential	78	\$10,113,042	\$5,056,521	\$15,169,563	\$15,169,563	196
Mobile/Manufactured Homes	676	\$62,511,623	\$31,255,812	\$93,767,435	\$93,767,435	1,697
Vacant	10	\$1,767,486	--	\$1,767,486	\$1,767,486	--
Total	2,023	\$306,576,418	\$154,623,503	\$461,199,921	\$461,199,921	4,244

Source: San Luis Obispo County Planning and Building Dept., Assessor's Office, ParcelQuest, Wood Plc Parcel Analysis, CalFire

Critical Facilities at Risk

Four critical facilities are located in very high fire hazard severity zones, as indicated in Table J.13.

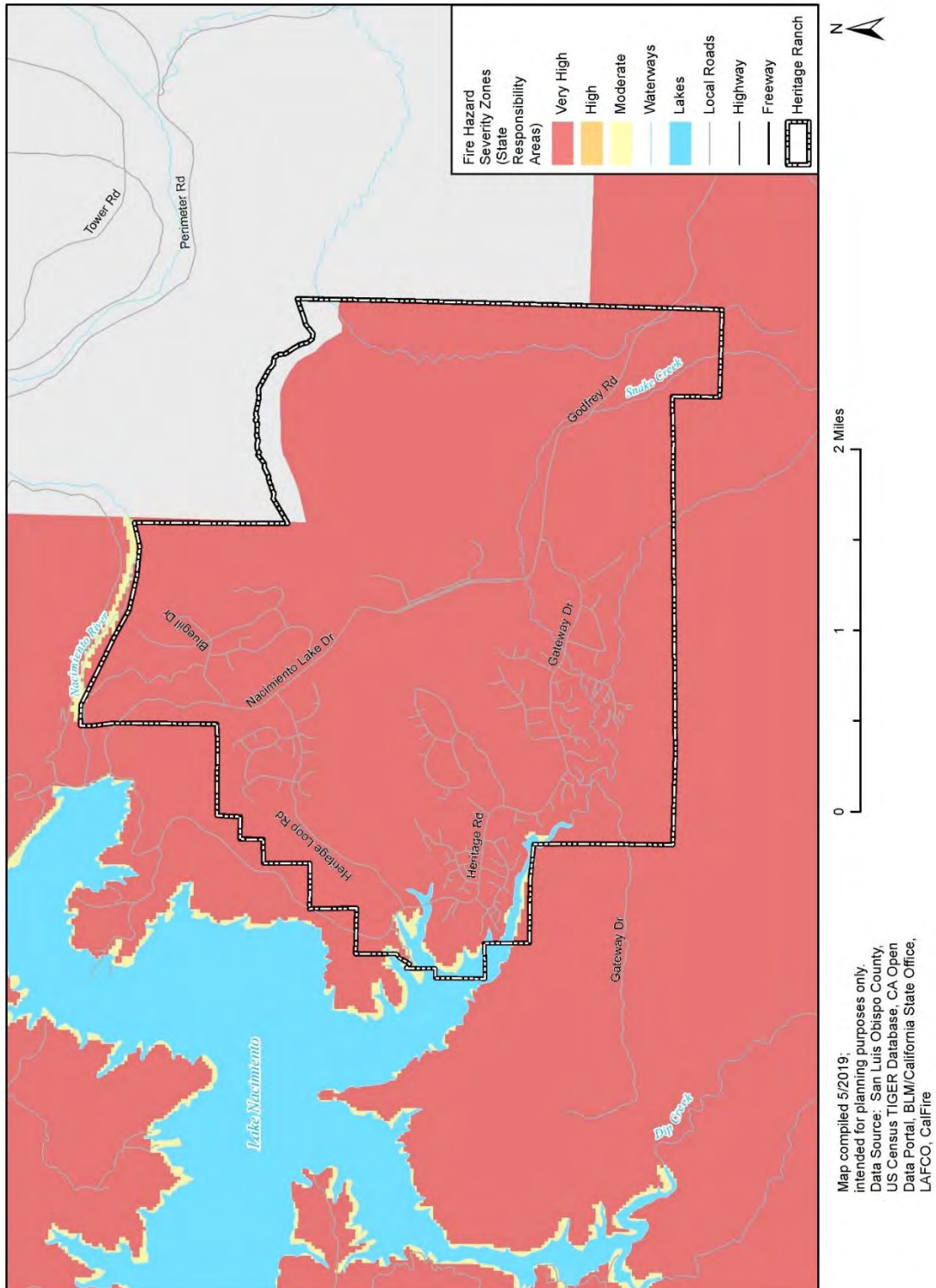
Table J.13 The Village of Heritage Ranch Critical Facilities in Very High Wildfire Hazard Zone

Facility Type	Count
Fire Stations	1
Emergency Medical Service Stations	1
Water Treatment Facilities	1
Wastewater Treatment Plant/Operations Yard/Administrative Building	1
Total	2

Source: San Luis Obispo County Planning and Building Dept., Assessor's Office, ParcelQuest, Wood Plc Parcel Analysis, CalFire



Figure J.8 Wildfire Hazard Severity Zones in the Heritage Ranch CSD





J.4 Capability Assessment

Capabilities are the programs and policies currently in use to reduce hazard impacts or that could be used to implement hazard mitigation activities. This capability assessment is divided into five sections: regulatory mitigation capabilities, administrative and technical mitigation capabilities, fiscal mitigation capabilities, mitigation outreach and partnerships, and other mitigation efforts.

To develop this capability assessment, the jurisdictional planning representatives used a matrix of common mitigation activities to inventory policies or programs that are in place. The team then supplemented this inventory by reviewing additional existing policies, regulations, plans, and programs to determine if they contributed to reducing hazard-related losses. During the plan update process, this inventory was reviewed by the jurisdictional planning representatives and Wood consultant team staff to update information where applicable and note ways in which these capabilities have improved or expanded. In summarizing current capabilities and identifying gaps, the jurisdictional planning representatives also considered their ability to expand or improve upon existing policies and programs as potential new mitigation strategies. The Heritage Ranch CSD capabilities are summarized below.

J.4.1 Regulatory Mitigation Capabilities

Table J.14 identifies existing regulatory capabilities the HRCSD has in place to help with future mitigation efforts. Note: many of the regulatory capabilities that can be used for the HRCSD are within the County's jurisdiction. Refer to Section 6 Capability Assessment of the Base Plan for specific information related to the County's mitigation capabilities.

Table J.14 Heritage Ranch CSD Regulatory Mitigation Capabilities

Regulatory Tool	Yes/No	Comments
General plan	Yes	By the County
Zoning ordinance	Yes	By the County
Subdivision ordinance	Yes	By the County
Growth management ordinance	Yes	By the County
Floodplain ordinance	Yes	By the County
Other special purpose ordinance (stormwater, water conservation, wildfire)	Yes	By the County
Building code	Yes	By the County
Fire department ISO rating	Yes	By the County
Erosion or sediment control program	Yes	By the County
Stormwater management program	Yes	By the County
Site plan review requirements	Yes	
Capital improvements plan	Yes	
Economic development plan	No	
Local emergency operations plan	Yes	
Other special plans	Yes	
Flood Insurance Study or other engineering study for streams	Yes	By the County
Elevation certificates (for floodplain development)	Yes	By the County

Source: Wood Data Collection Guide, 2019



J.4.2 Administrative/Technical Mitigation Capabilities

Table J.15 identifies the personnel responsible for activities related to mitigation and loss prevention in the Heritage Ranch Community Services District.

Table J.15 Heritage Ranch CSD Administrative/Technical Mitigation Capabilities

Personnel Resources	Yes/No	Department/Position/Comments
Planner/engineer with knowledge of land development/land management practices	Yes	General Manager, District Engineer
Engineer/professional trained in construction practices related to buildings and/or infrastructure	Yes	General Manager, District Engineer
Planner/engineer/scientist with an understanding of natural hazards	No	By the County
Personnel skilled in GIS	Yes	District Engineer
Full time building official	No	By the County
Floodplain manager	No	By the County
Emergency manager	Yes	General Manager
Grant writer	No	Would be able to do if need-driven
Other personnel	Yes	Water and Wastewater Operators; Office Staff
GIS Data Resources - (Hazard areas, critical facilities, land use, building footprints, etc.)	No	By the County
Warning systems/services (Reverse 9-11, outdoor warning signals)	No	By the County

Source: Wood Data Collection Guide, 2019

J.4.3 Fiscal Mitigation Capabilities

Table J.16 identifies financial tools or resources that the CSD could potentially use to help fund mitigation activities.

Table J.16 Heritage Ranch CSD Fiscal Mitigation Capabilities

Financial Resources	Accessible/Eligible to Use (Yes/No)
Community Development Block Grants	Yes
Capital improvements project funding	Yes
Authority to levy taxes for specific purposes	Yes
Fees for water, sewer, gas, or electric services	Yes
Impact fees for new development	Yes
Incur debt through general obligation bonds	Yes
Incur debt through special tax bonds	Yes
Incur debt through private activities	Yes
Withhold spending in hazard prone areas	No

Source: Wood Data Collection Guide, 2019

J.4.4 Mitigation Outreach and Partnerships

The Heritage Ranch Community Services District and the Heritage Ranch Owners Association (HROA) generally have the same boundary. The HROA has a safety committee which has Safety Plan separate from those of the HRCSD. Both entities coordinate on water, wastewater, and facility planning and management efforts to



operate effectively during an emergency. They additionally maintain a responsible water use policy and disseminate relevant information periodically. For example, the HRCSD recently completed a project in 2016 connecting the HRCSD water system intake facility to the Nacimiento Water Project pipeline for emergency uses, which highlights the community's outreach and partnership/collaboration intents and efforts.

J.4.5 Opportunities for Enhancement

Based on the capabilities assessment, the Heritage Ranch Community Services District has several existing mechanisms in place that already help to mitigate hazards, such as those mentioned in this Annex's hazard profiles and summary sections and in existing planning and community organization mechanisms such as the 2014 Heritage Ranch Village Plan. There are also opportunities for the HRCSD to expand or improve on these policies and programs to further protect the community. Future improvements may include providing training for staff members related to hazards or hazard mitigation grant funding in partnership with the County and Cal OES. Additional training opportunities will help to inform HRCSD staff and board members on how best to integrate hazard information and mitigation projects into the District policies and ongoing duties of the HRCSD. Continuing to train HRCSD staff on mitigation and the hazards that pose a risk to the HRCSD will lead to more informed staff members who can better communicate this information to the public.

J.5 Mitigation Strategy

J.5.1 Mitigation Goals and Objectives

The Heritage Ranch CSD adopts the hazard mitigation goals and objectives developed by the County Planning Team and described in Section 7 of the Base Plan: Mitigation Strategy.

J.5.2 Mitigation Actions

The Planning Team for the Heritage Ranch Community Services District identified and prioritized the following mitigation actions based on the conducted risk assessment (see Table J.17). Background information and information on how each action will be implemented and administered, such as ideas for implementation, responsible office, potential funding, estimated cost, and timeline are also included. Actions were prioritized using the process described in subsection 7.2.1 of the Base Plan. Actions with an asterisk (*) are those that mitigate losses to future development.



**Table J.17 Heritage Ranch CSD's Mitigation Action Plan**

ID	Hazard(s) Mitigated	Description/Background/Benefits	Lead Agency and Partners	Cost Estimate	Potential Funding	Priority	Timeline	Status/ Implementation Notes
HR.1	Adverse Weather	Consider support for communication towers and other communication infrastructure to be built within the HRCSD Boundary/property to provide expanded warning capabilities related to adverse weather.	Communication companies	Unknown	Private	Low	2019-2024	New
HR.2	Dam Incidents; Drought; Flooding; Landslide /Debris Flow	<p>The District currently has a vertical well project identified to mitigate low flows from the Dam during outages and/or drought, as well as to provide redundancy (mitigate) for high flow releases that have historically damaged or destroyed the current gallery well system.</p> <p>A vertical well(s) would provide mitigation for both low and high flows (drought and Dam incidents). A vertical well(s) would improve raw water quality if debris flow occurs within Nacimiento Reservoir and River like it did after the Chimney Fire.</p>	HRCSD	\$400,000	CIP funding; water fees; debt; grants	High	Design 2019/20; Construct 2020/21	New Some preliminary engineering completed (siting, borings, conceptual drawings, etc.)
HR.3	Dam Incidents; Drought; Flooding	Continue to engage with San Luis Obispo County Flood Control & Water Conservation District, and Monterey County Water Resources Agency to operate the Dam in a manner more conducive to preventing these hazards.	HRCSD; SLOFCWCD; MCWRA	Little to no cost	Staff Time/ Dept. Budget	Medium	2019-2020	New
HR.4	Earthquake	Increase risk awareness of the potential impacts of earthquakes to water and wastewater systems and conduct outreach to residents of same; Continue to partner with the Heritage Ranch Owners Association and their Emergency Services Committee on emergency planning.	HR Owners Association, HRCSD	Little to no cost	Staff Time/ Dept. Budget	Low	2019-2020	New
HR.5	Wildfire	Continue public education and awareness programs to advise residents of risk to life, health and safety; include information on defensible space and safe evacuation; Continue to partner with the Heritage Ranch Owners	HR Owners Association, HRCSD	Little to no cost	Staff Time/ Dept. Budget	Medium	2019-2020	New





ID	Hazard(s) Mitigated	Description/Background/Benefits	Lead Agency and Partners	Cost Estimate	Potential Funding	Priority	Timeline	Status/ Implementation Notes
		Association and their Emergency Services Committee on emergency planning.						





J.6 Implementation and Maintenance

Moving forward, the Heritage Ranch Community Services District will use the mitigation action table in the previous section to track progress on implementation of each project. Implementation of the plan overall is discussed in Section 8 in the Base Plan: Implementation and Monitoring.

J.6.1 Incorporation into Existing Planning Mechanisms

The information contained within this Annex and the Base Plan, including results from the Vulnerability Assessments and the Mitigation Strategy will be used by the HRCSD to help inform updates of the Heritage Ranch CSD's existing plans (e.g. 2014 Village Plan) as well as in the development of additional local plans, programs, regulations, and policies. Understanding the hazards which pose a risk and the specific vulnerabilities to the HRCSD and its sphere of influence will help in future capital improvement planning and development for the HRCSD. The San Luis Obispo County Planning & Building Department may utilize the hazard information when reviewing a site plan or other type of development applications within or nearby the boundaries of the Heritage Ranch Community Services District area. As noted in Section 8 Implementation and Monitoring, the Planning Team representative/s from the Heritage Ranch CSD will report on efforts to integrate the hazard mitigation plan into local plans, programs, regulations, and policies and will report on these efforts at the annual Hazard Mitigation Plan and Planning Team review meeting.

J.6.2 Monitoring, Evaluation and Updating the Plan

The Heritage Ranch Community Services District will follow the procedures to monitor, review, and update this plan in accordance with San Luis Obispo County as outlined in Section 8 of the Base Plan. The District will continue to involve the public in mitigation, as described in subsection 8.3 of the Base Plan. The HRCSD General Manager will be responsible for representing the HRCSD in related County Hazard Mitigation Plan meetings or events, and for coordination with County staff and departments during plan updates. The Heritage Ranch CSD realizes it is important to review the plan regularly and update it every five years in accordance with the FEMA Disaster Mitigation Act Requirements as well as other State of California requirements.





K.1 District Profile

K.1.1 Mitigation Planning History and 2019 Process

This annex was created during the development of the 2019 San Luis Obispo County Hazard Mitigation Plan Update. This Jurisdictional Annex builds upon the previous version of the Local Hazard Mitigation Plan for the Los Osos Community Services District; approved by FEMA in August 2005. That previous mitigation plan was not incorporated into the City's General Plan or other planning mechanisms; however, this updated mitigation plan will be integrated into those plans.

The General Manager of the Los Osos Community Services District was the representative on the county HMPC and took the lead for developing the plan this annex in coordination with the Los Osos Community Services District Local Planning Team (LPT). The LPT will be responsible for implementation and maintenance of the plan.

Table K.1 Los Osos CSD Hazard Mitigation Plan Planning Team

Department or Stakeholder	Title
Administration	General Manager
Fire	Battalion Chief
Water	Utility Manager

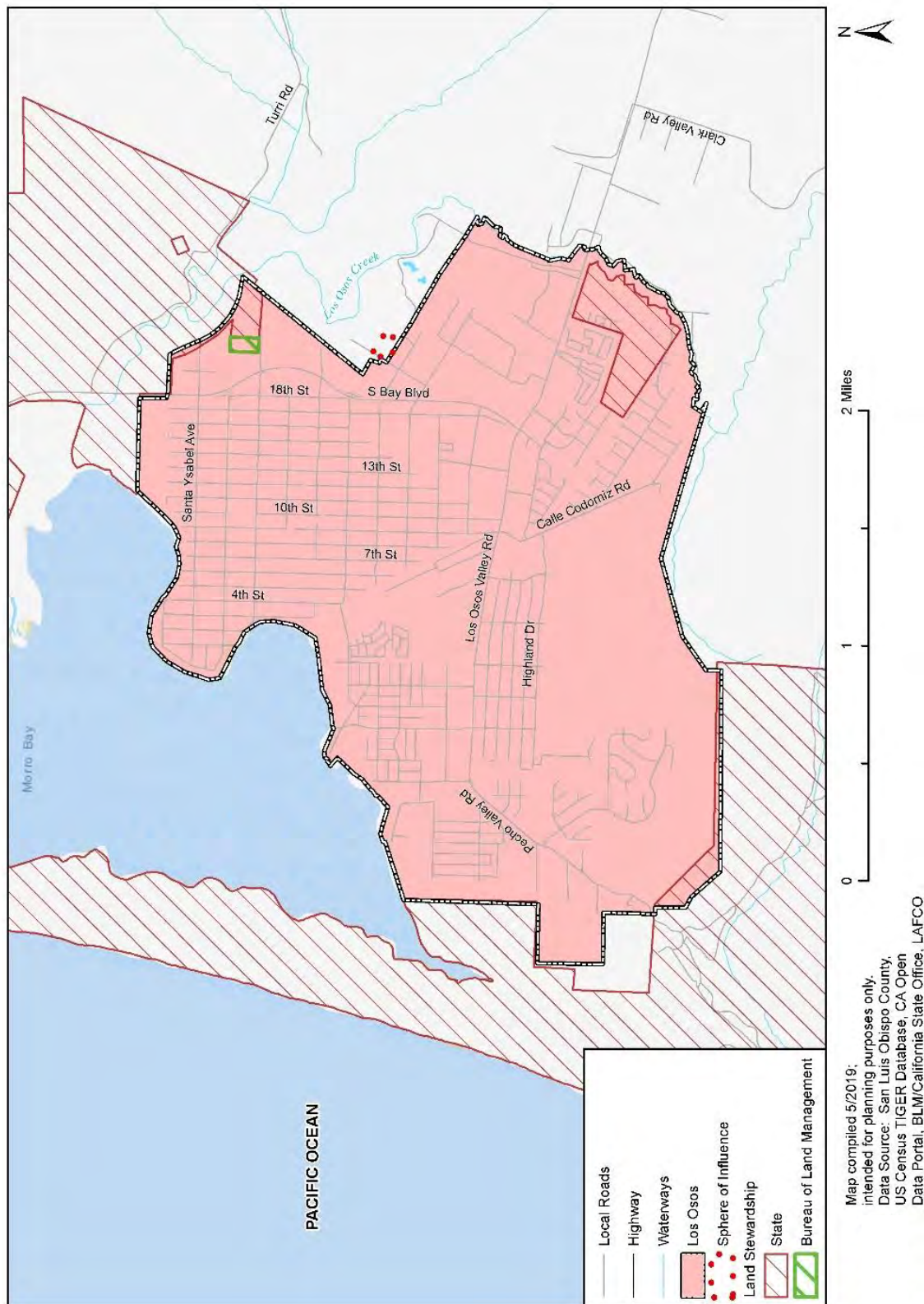
More details on the planning process followed and how the jurisdictions, service districts and stakeholders participated can be found in Section 3 of the Base Plan, as well as how the public was involved during the 2019 update.

Figure K.1 below is a map of the Los Osos planning area.





Figure K.1 Los Osos Community Services District





K.1.2 District Overview

The Los Osos Community Services District (District) is located south of the City of Morro Bay and west of the City of San Luis Obispo. The District provides multiple services to the unincorporated coastal area including, water, sewer, fire protection services among other services. The Morro Bay Estuary and Morro Bay State Park border the District on the northwest, while the Los Osos Creek is on the eastern border of the District and the prominent topographic feature, Irish Hills, as well as Montano de Oro State Park lies to the south and southwest.

The District was created on November 3, 1998 replacing the old County Service Area 9 with Los Osos' first public agency governed by community residents. District services include fire protection and emergency response, storm water drainage management, solid waste management, water supply for the Baywood area, parks and recreation, street lighting, and wastewater management.

The Los Osos Community Services District is governed by an elected Board of Directors with the authority to make decisions about various public utilities and services. The Board's primary responsibilities are water, sewage, drainage, and emergency services. The Board meets on the first Thursday of each month. All Board Meetings are public meetings and any member of the public can speak to the Board regarding any matter of District authority during the public comment period.

The Los Osos Community Services District has established five committees (Emergency Services Advisory Committee, Environmental, Finance, Water Utilities and Wastewater) to advise the Board on various aspects of its operations. The Board may create standing committees at its discretion.

Community service districts are prohibited by law from engaging in land use planning. Thus, a volunteer group, the Los Osos Community Advisory Council (LOCAC) has been formed to advise the San Luis Obispo County Board of Supervisors on land use planning, parks, transportation, and other issues that affect the community of Los Osos. LOCAC is an advisory council only; it does not have the authority to make decisions.

K.1.3 Development Trends

The U.S. Census Bureau estimated the Los Osos Census Designated Place's (CDP) 2017 population as 15,714, an increase from 14,874 in 2012; this represents an almost 6 percent increase in five years. Table K.2 shows an overview of key social and demographic characteristics of the CDP taken from the U.S. Census Bureau's American Community Survey.

Table K.2 Los Osos CDP Demographic and Social Characteristics, 2012-2017

Los Osos CDP	2012	2017	% Change
Population	14,874	15,714	5.6%
Median Age	45.9	47.4	3.3%
Total Housing Units	6,911	6,800	-1.6%
Housing Occupancy Rate	92.1%	93.6%	1.5%
% of Housing Units with no Vehicles Available	3.1%	3.4%	0.3%
Median Home Value	\$387,100	\$461,100	19.1%
Unemployment	7.5%	5.5%	-2.0%
Mean Travel Time to Work (minutes)	20.3	23.3	14.8%
Median Household Income	\$57,683	\$73,082	26.7%
Per Capita Income	\$31,257	\$38,701	23.8%
% of Individuals Below Poverty Level	8.1%	10.5%	2.4%



Los Osos CDP	2012	2017	% Change
# of Households	6,363	6,367	0.1%
Average Household Size	2.32	2.45	5.6%
% of Population Over 25 with High School Diploma	93.0%	93.2%	0.2%
% of Population Over 25 with Bachelor's Degree or Higher	35.6%	41.9%	6.3%
% with Disability	12.9%	15.0%	2.1%

Source: U.S. Census Bureau American Community Survey 2012-2017 5-Year Estimates, www.census.gov/

Note: Data is for the Los Osos Census Designated Place (CDP) which may not have the same boundaries as the Los Osos Community Service District.

The following table show how the Los Osos CDP's labor force breaks down by occupation and industry estimates from the U.S. Census Bureau's 2017 American Community Survey.

Table K.3 Los Osos CPD Employment by Industry (2017)

Industry	# Employed
Population (2017)	15,714
In Labor Force	7,735
Agriculture, forestry, fishing and hunting, and mining	78
Armed Forces	10
Construction	647
Manufacturing	348
Wholesale trade	96
Retail trade	873
Transportation and warehousing, and utilities	275
Information	179
Finance and insurance, and real estate and rental and leasing	365
Professional, scientific, and management, and administrative and waste management services	984
Educational services, and health care and social assistance	1,870
Arts, entertainment, and recreation, and accommodation and food services	665
Other services, except public administration	463
Public administration	458
Unemployed	424

Source: U.S. Census Bureau American Community Survey 2012-2017 5-Year Estimates, www.census.gov/

Note: Data is for the Los Osos Census Designated Place (CDP) which may not have the same boundaries as the Los Osos Community Service District.

K.1.4 Other Community Planning Efforts

The coordination and synchronization of this plan with other community planning mechanisms and efforts are vital to the success of this plan. To have a thorough evaluation of hazard mitigation practices already in place, appropriate planning procedures should also involve identifying and reviewing existing plans, policies, regulations, codes, tools, and other actions are designed to reduce a community's risk and vulnerability from natural hazards.

As an unincorporated community, Los Osos and the Los Osos Community Services District are referenced in other County planning documents and regulated by County policies and planning mechanisms. Integrating existing planning efforts, mitigation policies, and action strategies into this annex establishes a credible, comprehensive document that weaves the common threads of a community's values together. The development



of this jurisdictional annex involved a comprehensive review of existing plans, studies, reports, and initiatives from San Luis Obispo County and the Los Osos community that relate to hazards or hazard mitigation, as summarized in the table below. Information on how they informed the update are noted and incorporated where applicable.

Table K.4 Summary of Review of Key Plans, Studies and Reports

Plan, Study, Report Name	How Document Informed the Annex
Los Osos Community Plan (Public Review Draft January 30, 2015)	Incorporated background information on the community and CSD.
Los Osos Community Service District Local Hazard Mitigation Plan (August 2005)	Informed assets at risk, past hazard events, and background information on the District and the community.
Estero Area Plan (2009)	Informed natural assets section on the Sensitive Areas in the Los Osos community

In addition to the development standards within the Los Osos Community Plan, there are County planning mechanisms that regulate future and existing development within the Los Osos CSD planning area. Refer to subsection K.4 Capability Assessment for more information on the plans, policies, regulations and staff that govern the Los Osos planning area.

K.2 Hazard Identification and Summary

The Los Osos CSD planning team identified the hazards that affect the District and summarized their frequency of occurrence, spatial extent, potential magnitude, and significance specific to the Los Osos CSD (see Table K.5). There are no hazards that are unique to Los Osos.



**Table K.5 Los Osos CSD Hazard Risk Summary**

Hazard	Geographic Area	Probability of Future Occurrence	Magnitude/Severity (Extent)	Overall Significance
Adverse Weather	Significant	Likely	Limited	Medium
Coastal Storm/Coastal Erosion/Sea Level Rise	Limited	Occasional	Limited	Low
Drought	Significant	Likely	Limited	Medium
Earthquake	Extensive	Likely	Critical	High
Wildfire	Significant	Likely	Limited	High
Geographic Area Limited: Less than 10% of planning area Significant: 10-50% of planning area Extensive: 50-100% of planning area Probability of Future Occurrences Highly Likely: Near 100% chance of occurrence in next year or happens every year. Likely: Between 10 and 100% chance of occurrence in next year or has a recurrence interval of 10 years or less. Occasional: Between 1 and 10% chance of occurrence in the next year or has a recurrence interval of 11 to 100 years. Unlikely: Less than 1% chance of occurrence in next 100 years or has a recurrence interval of greater than every 100 years.		Magnitude/Severity (Extent) Catastrophic—More than 50 percent of property severely damaged; shutdown of facilities for more than 30 days; and/or multiple deaths Critical—25-50 percent of property severely damaged; shutdown of facilities for at least two weeks; and/or injuries and/or illnesses result in permanent disability Limited—10-25 percent of property severely damaged; shutdown of facilities for more than a week; and/or injuries/illnesses treatable do not result in permanent disability Negligible—Less than 10 percent of property severely damaged, shutdown of facilities and services for less than 24 hours; and/or injuries/illnesses treatable with first aid Significance Low: minimal potential impact Medium: moderate potential impact High: widespread potential impact		

K.3 Vulnerability Assessment

The intent of this section is to assess the Los Osos Community Services District's vulnerability separate from that of the planning area, which has already been assessed in Section 5 Hazard Identification and Risk Assessment in the Base Plan. This vulnerability assessment analyzes the population, property, and other assets at risk to hazards ranked of medium or high significance that may vary from other parts of the planning area.

The information to support the hazard identification and risk assessment for this Annex was collected through a Data Collection Guide, which was distributed to each participating municipality or special district to complete during the planning process. Information collected was analyzed and summarized in order to identify and rank all the hazards that could impact anywhere within the County, as well as to rank the hazards and identify the related vulnerabilities unique to each jurisdiction. In addition, the Los Osos CSD planning team members were asked to share information on past hazard events that have affected the Community Services District.

Each participating jurisdiction was in support of the main hazard summary identified in the Base Plan (See Table 5.2). However, the hazard summary rankings for each jurisdictional annex may vary slightly due to specific hazard



risk and vulnerabilities unique to that jurisdiction (See Table K.5). Identifying these differences helps the reader to differentiate the jurisdiction's risk and vulnerabilities from that of the overall County.

Note: The hazard "Significance" reflects overall ranking for each hazard and is based on the Los Osos CSD planning team input from the Data Collection Guide and the risk assessment developed during the planning process (see Section 5 of the Base Plan), which included a more detailed qualitative analysis with best available data.

The hazard summaries in Table K.5 reflect the hazards that could potentially affect the District. Based on this analysis, the priority hazards (High Significance) for mitigation are wildfire and drought. The discussion of vulnerability for each of the following hazards is in subsection K.3.2 Estimating Potential Losses. Those of Medium or High significance for the Los Osos CSD are identified below.

- Adverse Weather
- Drought
- Earthquake
- Wildfire

Other Hazards

The District rated hazardous trees as a high significance hazard. In terms of this plan hazardous trees are considered a cascading hazard for adverse weather, drought and wildfire hazards. Information related to the public concerns about tree mortality in relation to wildfire risk can be found under K.3.2 Estimating Potential Losses and in Section 5 of the Base Plan.

Hazards assigned a significance rating of Low and which do not differ significantly from the County ranking (e.g., Low vs. High) are not addressed further in this plan and are not assessed individually for specific vulnerabilities in this section. In the Los Osos Community Services District, coastal erosion/sea level rise, flooding, landslide and debris flows, land subsidence and tsunamis are hazards ranked as a low significance to the community service district.

Los Osos is not required to participate separately in the National Flood Insurance Program (NFIP), but will continue to support the County's participation in and compliance with the NFIP.

Additionally, the CSD's committee members decided to rate several hazards as Not Applicable (N/A) to the planning area due to a lack of exposure, vulnerability, and no probability of occurrence. The following hazards are considered Not Applicable (N/A) to the Los Osos Community Services District.

- Agricultural Pest Infestation and Disease
- Biological Agents (naturally occurring)
- Dam Incidents
- Liquefaction
- Seiches

K.3.1 Assets at Risk

This section considers the District's assets at risk, including values at risk, critical facilities and infrastructure, historic assets, economic assets, and growth and development trends.

Values at Risk

The following data on property exposure is derived from the San Luis Obispo County 2017 Parcel and Assessor data as well as data that was shared by the Los Osos Planning Team. This data should only be used as a





guideline to overall values in the Community Services District as the information has some limitations. The most significant limitation is created by Proposition 13. Instead of adjusting property values annually, the values are not adjusted or assessed at fair market value until a property transfer occurs. As a result, overall value information is likely low and does not reflect current market value of properties. It is also important to note that in the event of a disaster, it is generally the value of the infrastructure or improvements to the land that is of concern or at risk. Generally, the land itself is not a loss. Table K.6 shows the exposure of properties (e.g., the values at risk) broken down by property type for the Los Osos Community Services District.

A more detailed list of the CSD's assets at risk from the District's 2012 HMP can be found as an attachment at the end of this Annex.

Table K.6 2019 Property Exposure for the Los Osos CSD by Property Types

Property Type	Property Count	Improved Value	Content Value	Total Value
Agricultural	1	\$7,861	\$7,861	\$15,722
Commercial	116	\$44,306,521	\$44,306,521	\$88,613,042
Government/Utilities	52	\$3,090	--	\$3,090
Other/Exempt/Misc.	47	\$16,614,282	--	\$16,614,282
Residential	4,822	\$937,095,463	\$468,547,732	\$1,405,643,195
Multi-Family Residential	277	\$57,293,267	\$28,646,634	\$85,939,901
Mobile/Manufactured Homes	9	\$9,764,323	\$4,882,162	\$14,646,485
Residential: Other	22	\$4,304,874	\$2,152,437	\$6,457,311
Industrial	3	\$3,870,890	\$5,806,335	\$9,677,225
Vacant	22	\$3,488,140	--	\$3,488,140
Total	5,371	\$1,076,748,711	\$554,349,681	\$1,631,098,392

Source: Wood Plc analysis based on ParcelQuest and San Luis Obispo County Assessor's Office data 2019

Critical Facilities and Infrastructure

A critical facility may be defined as one that is essential in providing utility or direction either during the response to an emergency or during the recovery operation. See Section 5 of the Base Plan for more details on the definitions and categories of critical facilities.

An inventory of critical facilities in the District based on County GIS data is provided in Table K.7 and illustrated in Figure K.2.

Table K.7 Los Osos CSD's Critical Facilities

Facility Type	Counts
Day Care Facilities	6
Emergency Medical Service Stations	1
Fire Stations	1
Local Law Enforcement	1
Public Schools	3
Total	12

Source: Wood Plc analysis based on ParcelQuest and San Luis Obispo County Assessor's Office data 2019



Essential Facilities

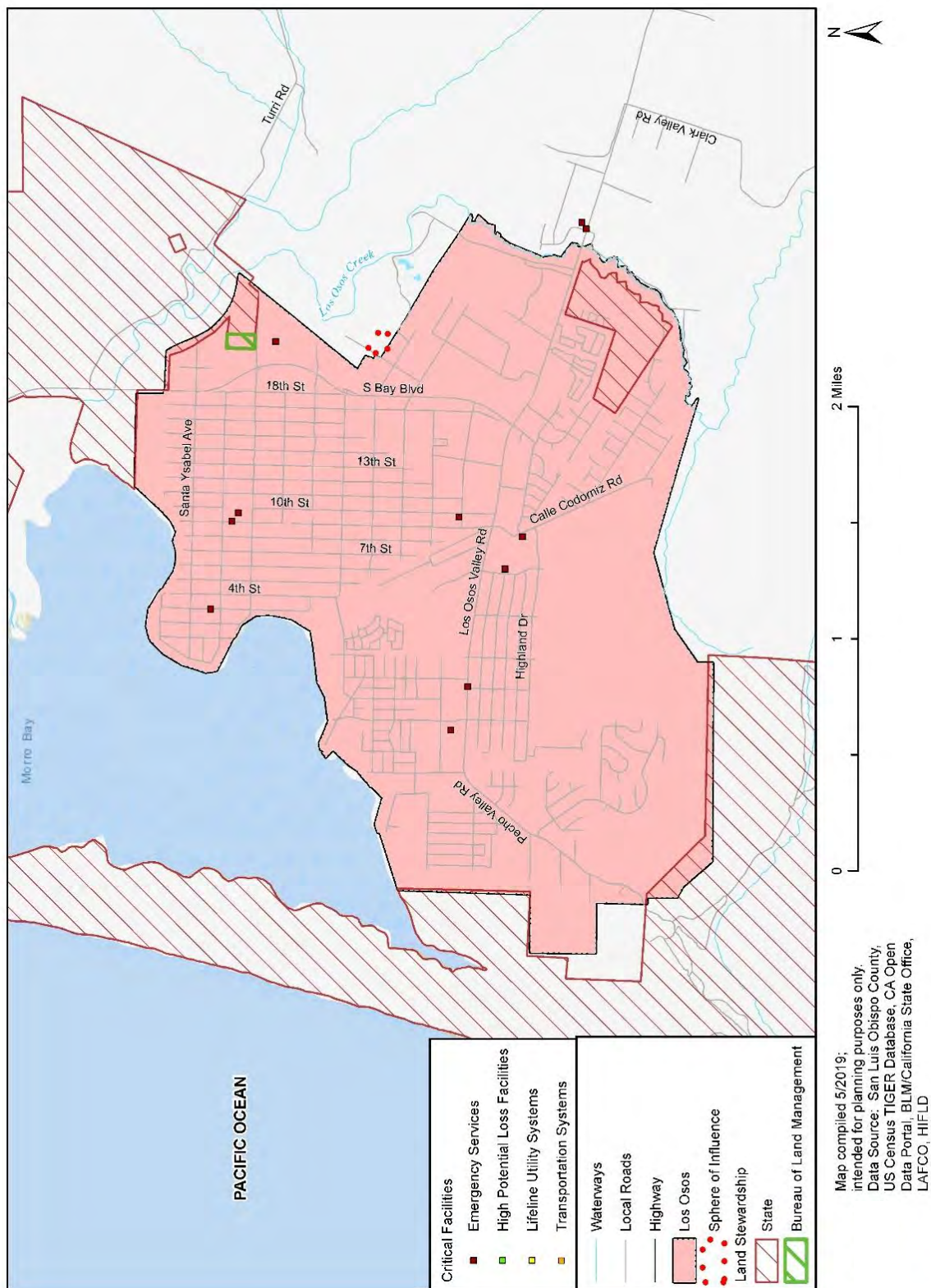
Essential facilities as identified by the Los Osos CSD Planning Team are as follows:

- Sheriff Sub-Station – 2099 10th Street
- South Bay Fire Department – 2315 Bayview Heights
- Water Treatment Facilities
- Water Tanks
- Nitrate Removal equipment





Figure K.2 Los Osos CSD's Critical Facilities





Transportation and Lifeline Facilities

The Los Osos CSD is situated in proximity to the regional transportation routes of Highway 101 and Highway 1 via Los Osos Valley Road and South Bay Boulevard. These are also the main arterial roads to access the planning area. The lack of alternative transportation routes during an evacuation was a noted significant concern for many residents in the Los Osos Community. The District's lifeline facilities include those listed in the essential facilities above.

Historic and Cultural Resources

No historic or cultural resources have been identified in the Los Osos CSD.

Natural Resources

Natural resources are important to include in benefit-cost analyses for future projects and may be used to leverage additional funding for projects that also contribute to community goals for protecting sensitive natural resources. Awareness of natural assets can lead to opportunities for meeting multiple objectives. For instance, protecting wetlands areas protects sensitive habitat as well as attenuates and stores floodwaters. The Los Osos CSD Planning Team identified the following significant natural assets:

- Los Osos Oak State Reserve
- Baywood Park
- Audubon Overlook
- Elfin Forest
- Sweet Springs Nature Preserve
- Montana De Oro State Park
- Los Osos Community Park
- Los Osos School 1872
- Morro Bay Estuary

Some of natural assets listed above are also areas designed in the Estero Area Plan (2009) combining designations for Sensitive Reserve Areas, which apply to the protection of special resources in the Los Osos community and its vicinity:

- Los Osos Oaks State Reserve (SRA) - The Los Osos forest is an 86-acre state park reserve containing outstanding examples of California pygmy oaks--stunted coast live oaks, growing in a stabilized dune area. Other oaks are also present, making this area an outstanding example of an oak woodland. The forest also includes a strip of open space preserved by the developer of Tract 527, but it is not open to public access.
- Los Osos Creek (SRA) - The lower eight miles of the creek are an anadromous fish stream (primarily steelhead), and adjacent riparian areas are rich in wildlife. Environmental concerns include contamination and excessive siltation of both the creek and the bay by development or other adverse uses occurring too close to the creek and its tributaries.
- Eto and Warden Lakes (SRA) - These are two of the few remaining isolated freshwater marshes in the county. Both lie within the Los Osos Creek drainage. The freshwater marshes, along with the associated riparian habitat, are important sites for migratory birds.
- Hazard Canyon and Vicinity (SRA) - The threatened Morro manzanita occurs only in the area between Baywood Park and Hazard Canyon. In addition, two of the six known stands of the endangered Indian Knob mountain balm occur in Hazard Canyon. Many other endemic plant species are found in the dunes near the mouth of the canyon. This area is an excellent example of the successive stages of dune stabilization. Much of this area is within Montaña de Oro State Park.





- Montaña de Oro Grassland (SRA) - The marine terrace between Islay and Coon Creeks is a mosaic of the *Stipa* grassland community and the northern coastal scrub and coastal sage scrub. The terrace also supports numerous wildflowers.
- Coon Creek (SRA). Several natural plant communities occur in this area. The most interesting is the Bishop pine forest located on steep slopes just outside Montaña de Oro State Park. This is a large conifer forest where specimens of the Bishop pine may have been first collected scientifically and used to describe the species. Coast live oak is intermixed with the conifer forest. The county's only native population of *Ceanothus griseus* is found in this area (Source: California Native Plant Society).

Economic Assets

Los Osos is a residential area, and there is very little commercial development.

K.3.2 Estimating Potential Losses

Note: This section details vulnerability to specific hazards of high or medium significance, where quantifiable, and/or where (according to HMPC member input) it differs from that of the overall County.

Table K.6 above shows Los Osos' exposure to hazards in terms of number and value of structures. San Luis Obispo County parcel and assessor data was used to calculate the improved value of parcels. The most vulnerable structures are unreinforced masonry buildings, and buildings built prior to the introduction of modern-day building codes. Impacts of past events and vulnerability to specific hazards are further discussed below. (See Section 5 of the Base Plan for more detailed information about these hazards and their impacts on San Luis Obispo County as a whole.)

Adverse Weather

Adverse weather in the Los Osos Community Services District includes hail, wind storms, and thunderstorms. Heavy rainfall events affect the District annually and the community's proximity to the Pacific Ocean tends to exaggerate adverse weather compared to inland communities. Combined with soil conditions and the presence of shallow-rooted Eucalyptus trees, heavy rains and moderate winds cause numerous tree-toppling events each year. Downed trees knock down power and communications lines, bringing disruptions lasting from a few hours to days in some locales in the District. Refer to Section 5 of the Base Plan for information on past adverse weather events in San Luis Obispo County.

Drought and Water Shortage

The Los Osos CSD is one of the three water purveyors in the Los Osos community. The District supplies water for domestic service and fire protection. The CSD's service area encompasses 633 acres of predominately residential land uses. The water supply for the Los Osos CSD consist of five active groundwater wells above the Los Osos Groundwater Basin. The District has a daily production capacity of approximately 1580 gallons per minute with all five wells being active.

The Los Osos Groundwater Basin is the only source of water for residential, commercial, institutional and agricultural uses in the Los Osos community. The basin was identified by the State as a high priority groundwater basin, which under Sustainable Groundwater Management Act of 2014 requires a basin plan to be developed and a committee be formed to implement the plan and monitor progress. According to the Los Osos Basin Plan (January 2015) the basin faces two primary challenges that pose a risk to the sustainability of the water supply; water quality degradation of the Upper Aquifer (UA), primarily by nitrate and seawater intrusions into the Lower Aquifer. Currently, Los Osos is under a building moratorium and relies on factors within the Basin Management Plan in order for the moratorium to be lifted.





The CSD has a Water Shortage Contingency Plan to enact during times of severe drought. The Contingency Plan consists of five stages (Stage One, Alert to Stage Five, Critical) each stage has a reduction target, climate trigger and the prohibitions to put in place. On April 2, 2015 the Los Osos CSD Board of Director Declared a Stage Three Emergency, which places the following prohibitions on residents in order to meet the reduction target of 25 percent.

- Penalties up to 2 times the established rate for usage above the allocation
- No leak adjustment credits will be awarded
- No new intent to Serve applications
- No allocations may be transferred to another property

Drought impacts are wide-reaching and may be economic, environmental, and/or societal. The most significant impacts associated with drought in the planning area are those related to water intensive activities such as wildfire protection, jurisdictional usage, commerce, tourism and recreation. Drought conditions can also cause soil to compact and not absorb water well, potentially making an area more susceptible to flooding.

Earthquake

The Los Osos 2012 Local Hazard Mitigation identifies three fault zones (Los Osos, Edna and Indian Knob) that could have potential impacts on the Los Osos Community Services District. The Los Osos fault poses the greatest risk to the CSD and its facilities. The fault is considered active and has the potential to generate a 6.8 magnitude earthquake. The San Simeon earthquake in 2003 which had impacts countywide caused significant damage to the Los Osos Community Services District's 16th Street North water storage tank. The tank was not anchored and endured what is referred to as "elephant foot" damage. The District repaired the tank with the assistance of FEMA and the California Office of Emergency Services (Cal OES). The improvements to the 16th Street tank secured the tank by anchoring it and repairing the lower shell where major damage had occurred. Other critical infrastructure, including the fire station, suffered damage that was repaired.

Los Osos Community Services District is located in a geologically complex and seismically active region that is subject to earthquakes and potentially strong groundshaking. Portions of the District are located on sand in-fill areas. These areas and those areas underlain by young, poorly consolidated, saturated granular alluvial sediments, would be most susceptible to the effects of liquefaction. These soil conditions are most frequently found in areas underlain by recent river and flood plain deposits, which have increased vulnerability to liquefaction when groundshaking occurs.

The following tables (Table K.8 Table K.9) shows the types of properties at moderate and high risk of liquefaction. Based on this analysis there are 988 properties at moderate risk of liquefaction with a total value of over \$324 million. Residential properties are the most vulnerable property type to liquefaction in Los Osos, with a combined total of 880 properties (including 2 mobile homes) located in an area of moderate liquefaction risk and a total value of nearly \$240 million.

Table K.8 Los Osos CSD's Liquefaction Risk by Property Type – Moderate Risk

Property Type	Property Count	Improved Value	Content Value	Total Value
Agricultural	1	\$7,861	\$7,861	\$15,722
Commercial	70	\$34,102,286	\$34,102,286	\$68,204,572
Government/Utilities	8	--	--	\$0
Other/Exempt/Misc.	21	\$6,625,714	--	\$6,625,714
Residential	682	\$121,222,661	\$60,611,331	\$181,833,992
Multi-Family Residential	177	\$33,981,650	\$16,990,825	\$50,972,475



Property Type	Property Count	Improved Value	Content Value	Total Value
Mobile/Manufactured Homes	2	\$1,475,614	\$737,807	\$2,213,421
Residential: Other	19	\$2,989,644	\$1,494,822	\$4,484,466
Industrial	3	\$3,870,890	\$5,806,335	\$9,677,225
Vacant	5	\$389,513	--	\$389,513
Total	988	\$204,665,833	\$119,751,267	\$324,417,100

Source: San Luis Obispo County Planning and Building Dept., Assessor's Office, ParcelQuest, Wood Plc Parcel Analysis

Table K.9 Los Osos CSD's Liquefaction Risk by Property Type – High Risk

Property Type	Property Count	Improved Value	Content Value	Total Value
Commercial	13	\$2,261,761	\$2,261,761	\$4,523,522
Government/Utilities	7	\$3,090	--	\$3,090
Other/Exempt/Misc.	6	\$3,437,429	--	\$3,437,429
Residential	451	\$82,857,177	\$41,428,589	\$124,285,766
Multi-Family Residential	14	\$4,126,546	\$2,063,273	\$6,189,819
Residential: Other	2	\$883,505	\$441,753	\$1,325,258
Vacant	5	\$319,410	--	\$319,410
Total	498	\$93,888,918	\$46,195,375	\$140,084,293

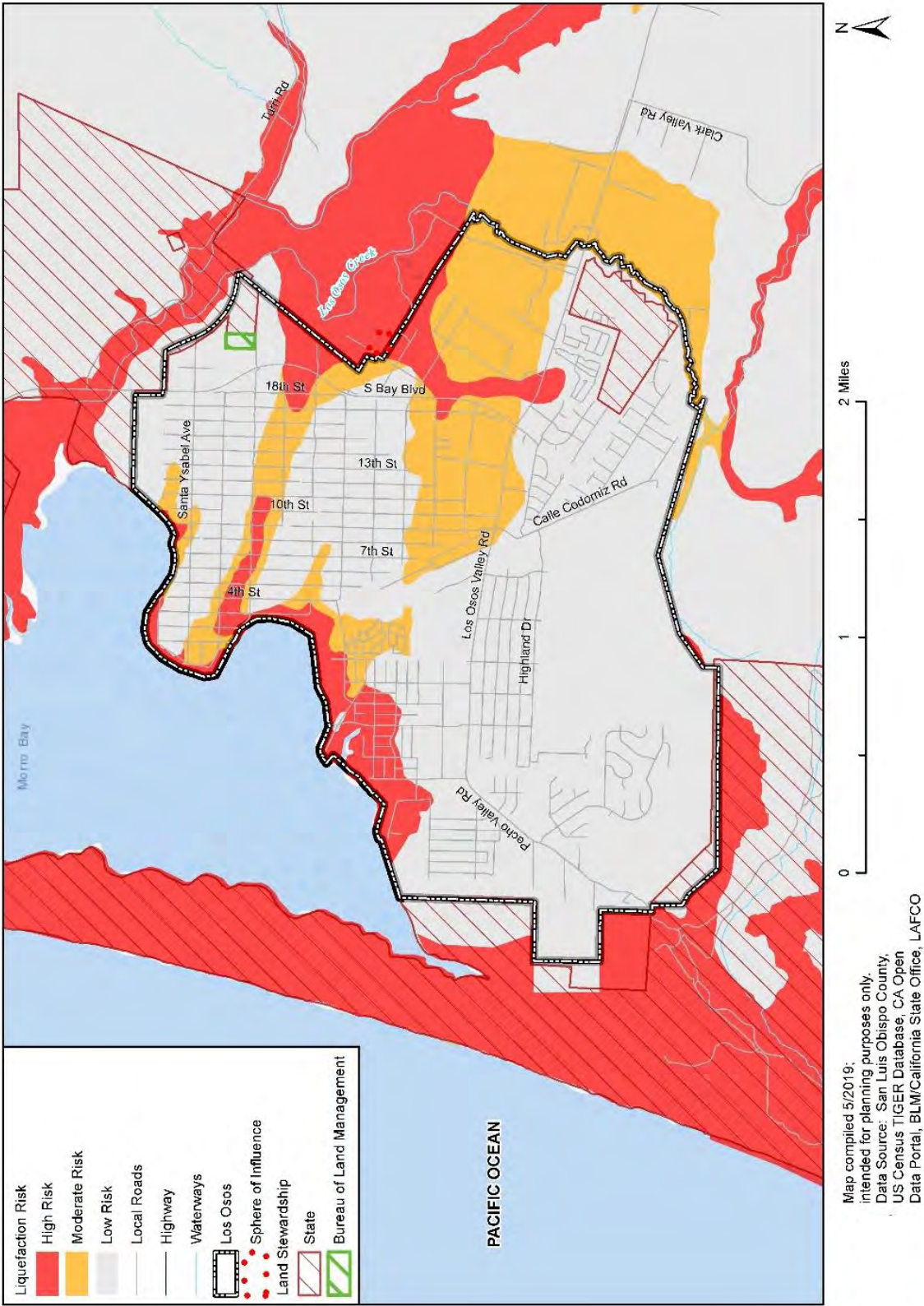
Source: San Luis Obispo County Planning and Building Dept., Assessor's Office, ParcelQuest, Wood Plc Parcel Analysis

Based on this analysis there are 498 properties at high risk of liquefaction with a total value of over \$140 million. Residential properties are the most vulnerable property type to liquefaction in Los Osos, with 467 residential properties in an area of high liquefaction risk for a total value of over \$131 million.

The following map depicts the areas of the Los Osos CSD that are at risk of liquefaction. The areas along the coastline to the District's east and north are at high risk of liquefaction, while the eastern portion of the District's boundaries are designated as moderate risk of liquefaction, including Los Osos Valley Road, the only major road out of the Los Osos CSD limits.



Figure K.3 Areas of Potential Liquefaction Risk





Wildfire

The climate in Los Osos Community Services District planning area is generally referred to as Mediterranean with warm dry summers and relatively cool, moderately wet winters. Rainfall throughout the District occurs primarily between November and April, and ranges between 20-25 inches per year. Because summers are generally warm and dry, the risk of wildfires is highest in late summer and early fall. Fog and cool weather that are common in the coastal regions help to maintain moisture levels in vegetation along the coast, which helps to minimize fire risk. Other factors such as wind, topography and overgrown vegetation may counteract the fog and cool weather climate in the planning area and increase in the risk of ignition. The District is a residential development that has occurred in the foothill areas around Los Osos and Montana De Oro State Park. The residential development is intermixed with native vegetation which results in a high-value, high-risk area.

One of the questions asked in the Public Survey for the County HMP was: *Do you have information on specific hazard issues/problems areas that you would like the planning committee to consider?* Several of the responses to this question came from residents of the Los Osos community (21% of the responses stated they lived in the Los Osos area). Residents expressed concern with the high density of eucalyptus trees in Los Osos and proximity to Montana de Oro State Park as a threat to their community. The limited number of evacuation routes out of the Los Osos was also identified as an area of concern for their community.

Several areas of the Los Osos community are within the high to very high severity wildfire hazard zones. Analysis using GIS was used to create the following tables, which quantify the potential losses by wildfire severity zones and property type. Based on the analysis there are 891 properties located in the high to very high severity zones. Of those properties 852 are residential properties (including 6 mobile/manufactured homes) with a combined value of \$381,329,349. In addition to the residential properties there is also a public school, Monarch Grove Elementary, located in the high wildfire hazard zone.

Table K.10 Los Osos CSD's Wildfire Risk by Property Type – High Severity SRA Zone

Property Type	Property Count	Improved Value	Content Value	Total Value	Loss Estimate
Government/Utilities	5	--	--	\$0	\$0
Other/Exempt/Misc.	1	\$1,517,084	--	\$1,517,084	\$1,517,084
Residential	114	\$31,039,882	\$15,519,941	\$46,559,823	\$46,559,823
Multi-Family Residential	2	\$212,084	\$106,042	\$318,126	\$318,126
Vacant	3	\$1,068,033	--	\$1,068,033	\$1,068,033
Total	125	\$33,837,083	\$15,625,983	\$49,463,066	\$49,463,066

Source: San Luis Obispo County Planning and Building Dept., Assessor's Office, ParcelQuest, Wood Plc Parcel Analysis

**Table K.11 Los Osos CSD's Wildfire Risk by Property – Very High Severity SRA Zone**

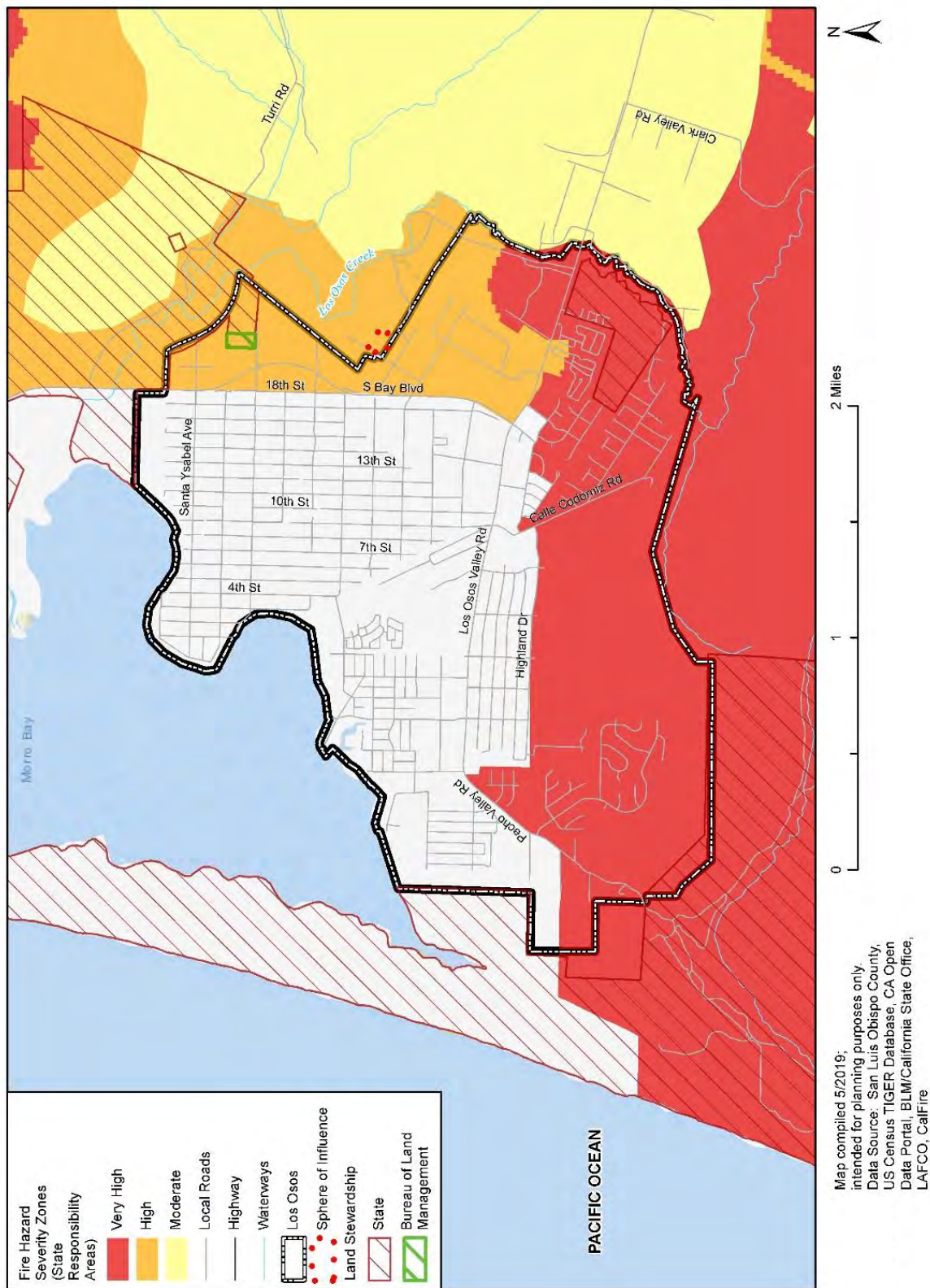
Property Type	Property Count	Improved Value	Content Value	Total Value	Loss Estimate
Agricultural	1	\$7,861	\$7,861	\$15,722	\$15,722
Government/Utilities	21	--	--	\$0	\$0
Other/Exempt/Misc.	2	--	--	\$0	\$0
Residential	729	\$214,837,365	\$107,418,683	\$322,256,048	\$322,256,048
Multi-Family Residential	1	\$21,525	\$10,763	\$32,288	\$32,288
Mobile/Manufactured Homes	6	\$8,108,709	\$4,054,355	\$12,163,064	\$12,163,064
Vacant	6	\$1,331,327	--	\$1,331,327	\$1,331,327
Total	766	\$224,306,787	\$111,491,661	\$335,798,448	\$335,798,448

Source: San Luis Obispo County Planning and Building Dept., Assessor's Office, ParcelQuest, Wood Plc Parcel Analysis





Figure K.4 Los Osos CSD Wildfire Risk





Coastal Storm/Coastal Erosion/Sea Level Rise

As part of the 2019 HMP planning effort, a sea level rise risk assessment was completed to determine how sea level rise may affect coastal jurisdictions and critical facilities and how coastal flooding might be exacerbated in the future. Table K.12 and Table K.13 summarize the properties at risk of inundation by sea level rise and sea level rise combined with a FEMA 1% annual chance flood. The area of inundation by sea level rise and sea level rise combined with the 1% flood are shown in Figure K.5 and Figure K.6, respectively. No critical facilities were determined to be at risk in the sea-level rise scenarios. See subsection 5.3.7 Coastal Storm/Coastal Erosion/Sea Level Rise in the base plan for more details on the scenarios and data sources used for this analysis.

Table K.12 Properties Inundated by Sea Level Rise and Sea Level Rise with 1% Annual Chance Flood

Property Type	25-cm SLR	75-cm SLR	300-cm SLR	25-cm SLR w/ 1% Flood	75-cm SLR w/ 1% Flood	300-cm SLR w/ 1% Flood
Commercial	--	2	12	3	5	15
Government/Utilities	--	--	1	--	1	1
Other/Exempt/Misc.	--	--	1	1	1	1
Residential	--	14	222	28	71	294
Multi-Family Residential	--	--	4	--	--	10
Mobile/Manufactured Homes	--	--	1	--	--	1
Residential: Other	1	1	3	3	3	3
Vacant	--	--	2	1	2	2
Total	1	17	246	36	86	327

Source: Wood analysis with USGS CoSMoS 3.1 data

Table K.13 Improved Values of Properties Inundated by Sea Level Rise and Sea Level Rise with 1% Annual Chance Flood

Property Type	25-cm SLR	75-cm SLR	300-cm SLR	25-cm SLR w/ 1% Flood	75-cm SLR w/ 1% Flood	300-cm SLR w/ 1% Flood
Commercial	--	\$546,320	\$2,243,469	\$744,960	\$883,510	\$2,544,092
Government/Utilities	--	--	--	--	--	--
Other/Exempt/Misc.	--	--	\$420,000	\$420,000	\$420,000	\$420,000
Residential	--	\$2,323,098	\$41,957,596	\$4,462,878	\$12,338,675	\$55,511,993
Multi-Family Residential	--	--	\$1,264,339	--	--	\$3,120,843
Mobile/Manufactured Homes	--	--	\$62,149	--	--	\$62,149
Residential: Other	\$75,059	\$75,059	\$2,084,548	\$2,084,548	\$2,084,548	\$2,084,548
Vacant	--	--	\$21,225	\$10,404	\$21,225	\$21,225
Total	\$75,059	\$2,944,477	\$48,053,326	\$7,722,790	\$15,747,958	\$63,764,850

Source: Wood analysis with USGS CoSMoS 3.1 data



Figure K.5 Los Osos Sea Level Rise Scenario Analysis: Tidal Inundation Only





Figure K.6 Los Osos Sea Level Rise Scenario Analysis: Tidal Inundation and 1% Annual Chance Flood





K.4 Capability Assessment

Capabilities are the programs and policies currently in use to reduce hazard impacts or that could be used to implement hazard mitigation activities. This capability assessment is divided into five sections: regulatory mitigation capabilities, administrative and technical mitigation capabilities, fiscal mitigation capabilities, mitigation outreach and partnerships, and other mitigation efforts.

To develop this capability assessment, the jurisdictional planning representatives used a matrix of common mitigation activities to inventory which of these policies or programs were in place. The team then supplemented this inventory by reviewing additional existing policies, regulations, plans, and programs to determine if they contributed to reducing hazard-related losses.

During the plan update process, this inventory was reviewed by the jurisdictional planning representatives and Wood consultant team staff to update information where applicable and note ways in which these capabilities have improved or expanded. In summarizing current capabilities and identifying gaps, the jurisdictional planning representatives also considered their ability to expand or improve upon existing policies and programs as potential new mitigation strategies. The Los Osos CSD capabilities are summarized below.

K.4.1 Regulatory Mitigation Capabilities

Table K.14 identifies existing regulatory capabilities the District has in place to help with future mitigation efforts. Note, many of the regulatory capabilities that can be used for the District are within the County's jurisdiction. Refer to Section 6 of the Base Plan for specific information related to the County's mitigation capabilities.

Table K.14 Los Osos CSD Regulatory Mitigation Capabilities

Regulatory Tool	Yes/No	Comments
General plan	Yes	County, Estero Area Plan
Zoning ordinance	Yes	County
Subdivision ordinance	Yes	
Growth management ordinance	Yes	County
Floodplain ordinance	Yes	County
Other special purpose ordinance (stormwater, water conservation, wildfire)	Yes	County
Building code	Yes	County
Fire department ISO rating	Yes	County
Erosion or sediment control program	Yes	County
Stormwater management program	Yes	County
Site plan review requirements	Yes	County
Capital improvements plan	Yes	County
Economic development plan	Yes	County
Local emergency operations plan	Yes	County
Other special plans	No	
Flood Insurance Study or other engineering study for streams	Yes	County
Elevation certificates (for floodplain development)	No	

Source: Wood Data Collection Guide, 2019



K.4.2 Administrative/Technical Mitigation Capabilities

Table K.15 identifies the personnel responsible for activities related to mitigation and loss prevention in the Los Osos Community Services District.

Table K.15 Los Osos CSD Administrative/Technical Mitigation Capabilities

Personnel Resources	Yes/No	Department/Position
Planner/engineer with knowledge of land development/land management practices	Yes	County Planning and District Engineer
Engineer/professional trained in construction practices related to buildings and/or infrastructure	Yes	County Planning and District Engineer
Planner/engineer/scientist with an understanding of natural hazards	Yes	County
Personnel skilled in GIS	Yes	County
Full time building official	Yes	County
Floodplain manager	NA	County
Emergency manager	Yes	County
Grant writer	Yes	Los Osos CSD
Other personnel	Yes	Emergency Services Advisory Committee, County; South Bay Fire Department
GIS Data Resources (Hazard areas, critical facilities, land use, building footprints, etc.)	Yes	County
Warning systems/services (Reverse 9-11, outdoor warning signals)	Yes	County Sheriff's Office

Source: Wood Data Collection Guide, 2019

K.4.3 Fiscal Mitigation Capabilities

Table K.16 identifies financial tools or resources that the CSD could potentially use to help fund mitigation activities.

Table K.16 Los Osos CSD Fiscal Mitigation Capabilities

Financial Resources	Accessible/Eligible to Use (Yes/No)
Community Development Block Grants	No
Capital improvements project funding	Yes
Authority to levy taxes for specific purposes	Yes
Fees for water, sewer, gas, or electric services	No
Impact fees for new development	Yes
Incur debt through general obligation bonds	Yes
Incur debt through special tax bonds	Yes
Incur debt through private activities	No
Withhold spending in hazard prone areas	No

K.4.4 Mitigation Outreach and Partnerships

The Los Osos CSD has ongoing public education and information programs related to general emergency preparedness, water conservation, and wildfire mitigation practices for homeowners. In partnership with the Cal FIRE, the SLO County Fire Department provides Community Emergency Response Team (CERT) classes to Los



Osos residents. Cal FIRE and the community's Fire Safe Council are also working with the District and the community on a fire prevention specific to the Los Osos community. The District plans to continue to implement planned greenbelts and fuel breaks; Los Osos CSD passed a Hazardous Vegetation Abatement Ordinance to assist the South Bay Fire Department in aggressively managing the defensible space around homes and vacant properties in the community. The District's website has valuable information related to various hazards including wildfire and information on defensible spaces and residential fire sprinklers and tsunami inundation maps and evacuation information specific to Los Osos.

The Los Osos CSD Emergency Services Advisory Committee was established in 2008 to assist the District's Board of Directors in providing emergency services to the District. Advisory Committee meetings are a public forum with the ability for the public to review and provide input on issues.

K.4.5 Opportunities for Enhancement

Based on the capabilities assessment, the Los Osos Community Service District has several existing mechanisms in place that already help to mitigate hazards. There are also opportunities for the District to expand or improve on these policies and programs to further protect the community. This planning process will help to inform the District's current efforts in the development of a community wide emergency preparedness program. Other future improvements may include providing training for staff members related to hazards or hazard mitigation grant funding in partnership with the County and Cal OES. Additional training opportunities will help to inform District staff, the Emergency Services Advisory Committee and District Board members on how best to integrate hazard information and mitigation projects into the District policies and ongoing duties of the District. Continuing to train District staff on mitigation and the hazards that pose a risk to the Los Osos Community Service District will lead to more informed staff members who can better communicate this information to the public.

K.5 Mitigation Strategy

K.5.1 Mitigation Goals and Objectives

The Los Osos CSD adopts the hazard mitigation goals and objectives developed by the HMPC and described in Section 7 Mitigation Strategy.

K.5.2 Completed 2012 Mitigation Actions

During the 2019 planning process the Los Osos Community Services District Planning Team reviewed all the mitigation actions from the 2012 plan. Actions were prioritized using the process described in subsection 7.2.1 of the Base Plan. During the 2019 planning process the Planning Team identified that of their eleven mitigation actions from 2012, three of the actions have been completed, demonstrating progress and building the community's resiliency to disasters; see Table K.17 below. Table K.18: Los Osos Community Services District's Mitigation Action Plan describes all the in progress actions as well as new mitigation action from the Planning Team.



**Table K.17 Los Osos CSD Mitigation Action Completed from 2012 Plan**

ID	Corresponding Hazard(s)	Mitigation Action	Lead Agency	Priority	Actions Status Notes
1	Wildfire	Inside the District – implement planned greenbelts and fuel breaks, and continue hazard abatement program	Los Osos Focus Group, Cal Fire, LOCSD	High	We have an abatement program - complete. Green belt and fuel breaks in constant progress.
3	Earthquake, Water Tank Failures	Public education, flexible connections at tanks, tank retro-fitting	LOCSD	High	Project completed 2007
4	Hazardous Materials	Monitoring equipment, public awareness	SLO County Environmental Health	Medium	Project Complete

K.5.3 Mitigation Actions

The planning team for the Los Osos Community Service District identified and prioritized the following mitigation actions based on the risk assessment. Actions were prioritized using the process described in subsection 7.2.1 of the Base Plan. Background information and information on how each action will be implemented and administered, such as ideas for implementation, responsible office, potential funding, estimated cost, and timeline are also included.



**Table K.18 Los Osos Community Services District's Mitigation Action Plan**

ID	Hazard(s) Mitigated	Description/ Background/ Benefits	Lead Agency and Partners	Cost Estimate	Potential Funding	Priority	Timeline	Status/ Implementation Notes
LO.1	Flood	Improve drainage, public education on construction management, evacuation routes and vegetation management	LOCSD, SLO County	\$10,000 to \$50,00	FEMA HMA	High	3-5 yrs.	In progress. All drainage areas have been improved/upgraded. Vegetation management is in progress
LO.2	Drought, Earthquake	Engineer and install a SCADA system to improve water efficiencies and mitigate water loss if system is compromised during an earthquake.	LOCSD	\$10,000 to \$50,00	District Budget	High	1 yr.	This is a 2019/2020 scheduled project
LO.3	Wildfire	Educate the public to take precautions to prevent potentially harmful fires and be educated about surviving them. The District is encouraging local organizations to involve the residents of Los Osos and is helping coordinate town hall meetings, Community Emergency Response Team training and sending social media blasts regarding fire safety. There are many local organizations that residents can join in order to be better prepared in case of a fire; Fire Safe Council, Fire Wise Cabrillo, and the Emergency Services Advisory Committee to the Los Osos Board of Directors. Benefits: With an involved community we hope to reduce risks of wildland fires to a minimum. In case of a wildfire, we hope that the community will be prepared in order to avoid human and property loss.	Los Osos CSD / South Bay Fire Dept	Little to no cost	District Budget	High	Other	Annual Implementation





K.6 Implementation and Maintenance

Moving forward, the Los Osos Community Service District will use the mitigation action table in the previous section to track progress on implementation of each project. Implementation of the plan overall is discussed in Section 8 in the Base Plan.

K.6.1 Incorporation into Existing Planning Mechanisms

The information contained within this plan, including results from the Vulnerability Assessment and the Mitigation Strategy, will be used by the Community Service District to help inform updates of the Los Osos Community Plan and in the development of additional local plans, programs and policies. Understanding the hazard that pose a risk and the specific vulnerabilities to the jurisdiction will help in future capital improvement planning for the District. The County Planning and Building Department may utilize the hazard information when reviewing a site plan or other type of development applications with the boundaries of the Los Osos Community Service District area. As noted in Section 8 Plan Implementation and Monitoring, the HMPC representatives from the Los Osos Community Services District will report on efforts to integrate the hazard mitigation plan into local plans, programs and policies and will report on these efforts at the annual HMPC plan review meeting.

K.6.2 Monitoring, Evaluation and Updating the Plan

The Los Osos Community Service District will follow the procedures to monitor, review, and update this plan in accordance with San Luis Obispo County as outlined in Section 8 of the Base Plan. The District will continue to involve the public in mitigation, as described in subsection 8.3 of the Base Plan. The CSD General Manager will be responsible for representing the Community Services District in the County HMPC, and for coordination with County staff and departments during plan updates. The Los Osos Community Services District realizes it is important to review the plan regularly and update it every five years in accordance with the Disaster Mitigation Act Requirements as well as other State of California requirements.





L.1 District Profile

L.1.1 Mitigation Planning History and 2019 Process

This Annex was created during the development of the 2019 San Luis Obispo County Hazard Mitigation Plan Update. The General Manager of the Nipomo Community Services District (CSD) was the representative on the County HMPC and took the lead for developing the plan and this annex in coordination with the Nipomo Community Services District (CSD) Local Planning Team (Planning Team). The Local (District) Planning Team will be responsible for implementation and maintenance of the plan. Table L.1 summarizes the District's planning team for the plan revision process.

Table L.1 Nipomo CSD Hazard Mitigation Plan Planning Team

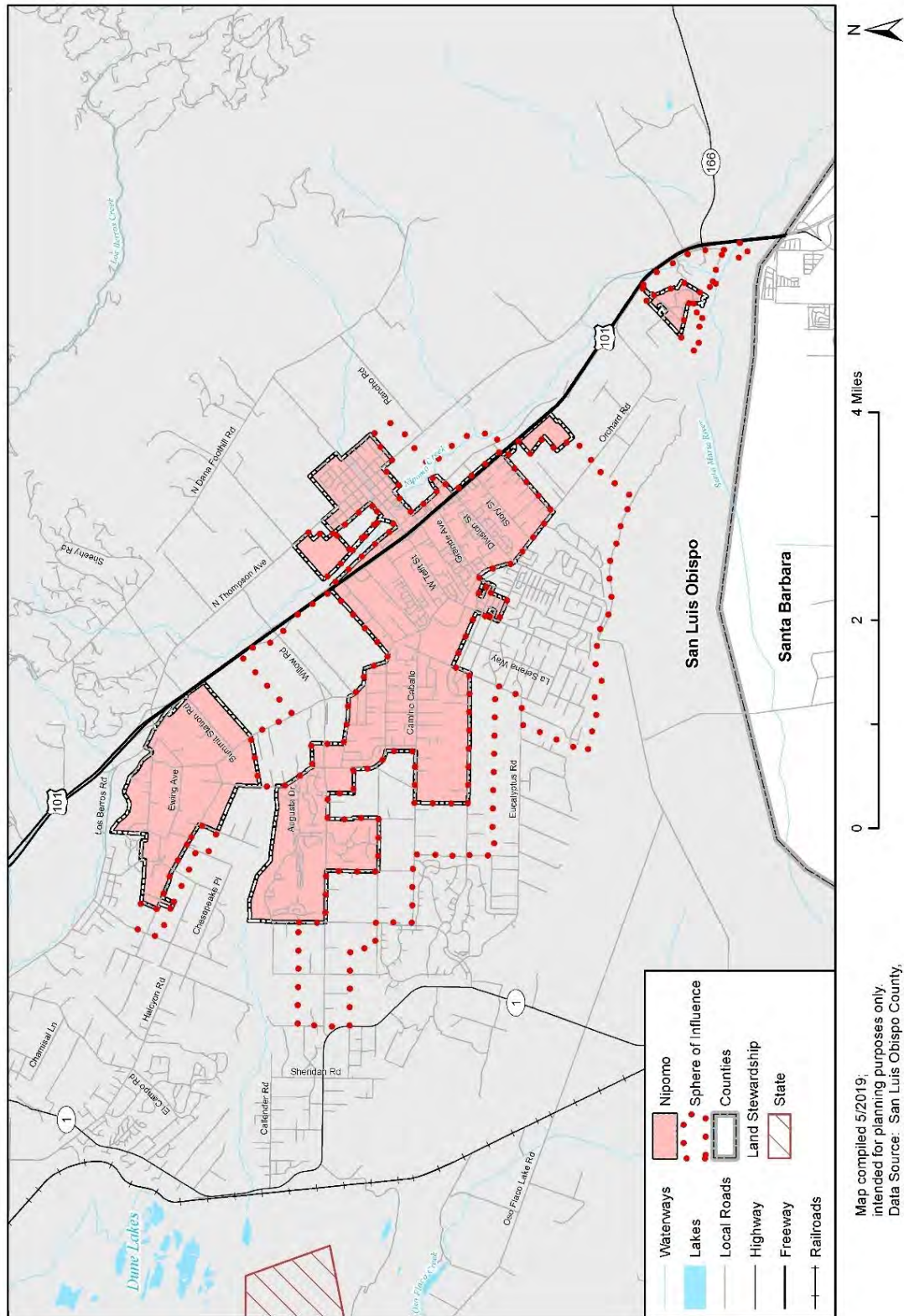
Department or Stakeholder	Title
Nipomo CSD	General Manager

More details on the planning process and how the jurisdictions, service districts, and stakeholders participated can be found in Section 3 of the Base Plan, along with how the public was involved during the 2019 update.

Figure L.1 is a map of the larger Nipomo community including its sphere of influence and nearby areas.



Figure L.1 Nipomo Community Services District



Map compiled 5/2019;
intended for planning purposes only.
Data Source: San Luis Obispo County,
US Census TIGER Database, CA Open
Data Portal, BLM/California State Office, LAFCO



L.1.2 District Overview

The Nipomo Community Services District's (CSD) mission is to provide its customers with reliable, quality, and cost-effective services now and in the future. The District was established in 1965 under the Community Services District Law of the Government Code Section 61000, assisted by the Nipomo Citizen's Steering Committee. The proposed District at the time consisted of 1,384 acres that included 560 dwellings and about 2,300 people hoping to solve the community's early water and sewer problems after several typhoid fever cases in the early 1960s tied the health issues to nitrates in the water and proximity to sewer tanks.

In present times, the Nipomo CSD is governed by a board of directors, each with different committee assignments and possible delegations. This Board is responsible for providing counsel related to water management and resources, overall administration, financing/auditing, and facilities to the Nipomo community.

Nipomo is located in the southwest portion of the County of San Luis Obispo next to Highway 101, within the South County Planning Area. It currently serves about 14,000 people in a somewhat rural environment between the Five Cities Area of the County and the City of Santa Maria (in the County of Santa Barbara). The Nipomo CSD has expanded to cover over six square miles, and provides limited stormwater, street lighting, and landscape maintenance. The District's sphere of influence covers about nine square miles in addition to the current service area and based on the latest LAFCO-developed Municipal Service Review, growth in the Nipomo area is expected to follow a 1% rate over the next 20 years.

The bulk of the CSD's facilities are comprised of pipes, pumps, ponds, and tanks. Recent efforts related to the District's water infrastructure have been focused on earthquake related hazards, due to the District's location atop an ancient sand dune as well as crossing of several earthquake faults. Exposure to liquefaction and other earth movement issues is of concern to Nipomo as well, but there has not been any recent damage to key infrastructure from earthquake and liquefaction hazards.

Nipomo developed their most recent Strategic Plan in 2018. This plan outlines the District's initial priority issues for the coming years (among other key plan aspects), and these were identified during workshops and interviews with the board members, managers, and directors of local operative processes. Three priorities were outlined in this Strategic Plan document: 1) Maintain and enhance community sustainability, financial stability, and infrastructure stability; 2) optimize operations and achieve customer satisfaction; and, 3) attain operational resiliency and encourage employee leadership and development. In terms of hazards and related mitigation opportunities, it is important to acknowledge these goals and objectives to ensure effective planning mechanisms and efforts across the District, especially to enable or help move forward currently ongoing activities.

L.1.3 Development Trends

The Nipomo CSD adopted its Community Plan in 2014, to "establish a vision for the future that will guide land use and transportation over the next 20 years" (Nipomo Community Plan, 2014). This Community Plan contains information on the existing and future status of water supplies, wastewater/sewage, schools, and various public services the District provides. Historic flood risks and local resources are also noted and are key to this hazard mitigation plan.

As of 2010, the U.S. Census Bureau noted the CSD's population to be approximately 16,714. Prior to 2015, Nipomo was relying solely on groundwater sources. Although growth has been very slight and slow in Nipomo, due to extreme drought and growing water demands, groundwater was becoming scarce and shortage conditions required solutions to balance supply versus demand in the District. In 2015, the District began a \$17 million public works project (the largest and most important in the District's 50-year history) to obtain





supplemental water from Santa Maria, back in 2015. Water deliveries began that year, allowing for millions of gallons to avoid being pumped from the troubled water basin underlying the Nipomo Mesa.

L.1.4 Other Community Planning Efforts

The coordination and synchronization with other community planning mechanisms and efforts are vital to the success of this Plan. To have a thorough evaluation of hazard mitigation practices already in place, appropriate planning procedures should also involve identifying and reviewing existing plans, policies, regulations, codes, tools, and other actions are designed to reduce a community's risk and vulnerability from natural hazards.

As an unincorporated community, the Nipomo CSD is referenced in other County planning documents and regulated by County policies and planning mechanisms. Integrating existing planning efforts, mitigation policies, and action strategies into this annex establishes a credible, comprehensive document that weaves the common threads of a community's values together. The development of this Community Services District Annex involved a comprehensive review of existing plans, studies, reports, and initiatives from San Luis Obispo County and the Nipomo community that relate to hazards or hazard mitigation. A high-level summary of the key plans, studies and reports is summarized in Table L.2. Information on how they informed the update are noted and incorporated where applicable.

In addition to the development standards within the Nipomo Strategic Plan, there are County planning mechanisms that regulate future and existing development within the Nipomo CSD planning area. Refer to subsection L.4 Capability Assessment for more information on the plans, policies, regulations and staff that govern the Nipomo CSD.

Table L.2 Summary of Review of Key Plans, Studies, and Reports for Nipomo CSD

Plan, Study, Report Name	How Document Informed the Annex
County of San Luis Obispo Local Hazard Mitigation Plan (2014)	Informed past hazard event history, hazard profile and background, and mitigation strategy information.
County of San Luis Obispo Land Use and Circulation Elements (Part II): The Area Plans – Inland and South County Area Plans	Obtained water use information, drought related details, etc.
Nipomo Community Services District 2018 Strategic Plan	Obtained current District information, ongoing efforts, water use information, etc.
Nipomo Community Plan – Updated 2014	Obtained District information, history, past programs, etc.
Nipomo's Supplemental Water from Santa Maria project summary	Obtained information on past and ongoing water purchase/acquisition efforts and the drought/water scarcity hazard.
San Luis Obispo County 2014 Integrated Regional Water Management Plan	Obtained information on water use in Nipomo, water management regions, and the drought/water scarcity hazard.
State of California's Hazard Mitigation Plan – Updated 2018	General information on hazards, events, and vulnerability assessments.
San Luis Obispo County Dam and Levee Failure Evacuation Plan – Updated 2016	Flooding, dam, and levee hazard information and recent studies.
2014-2016 Resource Summary Report for San Luis Obispo County's General Plan	Pulled information about water resources, reliability, and ongoing efforts to increase resilience in the County and District of Nipomo as related to drought.

L.2 Hazard Identification and Summary

The Nipomo CSD planning team identified the key hazards that affect the District, and summarized their frequency of occurrence, spatial extent, potential magnitude, and overall significance specific to the Nipomo



CSD (see Table L.3). There are no hazards that are unique to this CSD. (Note that earthquake and liquefaction hazards will be profiled together as one under subsection L.3.2)

Table L.3 Nipomo CSD Hazard Risk Summary

Hazard	Geographic Area	Probability of Future Occurrence	Magnitude/Severity (Extent)	Overall Significance
Dam Incidents and Failure	Limited	Unlikely	Limited	Low
Drought and Water Shortage	Significant	Likely	Limited	High
Earthquake (including Liquefaction)	Extensive	Likely	Limited	Medium
Flood	Limited	Occasional	Limited	Low
Landslide and Debris Flow	Limited	Unlikely	Limited	Low
Wildfire	Significant	Occasional	Limited	Medium
Human Caused: Hazardous Materials	Significant	Highly Likely	Negligible	Medium
Geographic Area Limited: Less than 10% of planning area Significant: 10-50% of planning area Extensive: 50-100% of planning area Probability of Future Occurrences Highly Likely: Near 100% chance of occurrence in next year or happens every year. Likely: Between 10 and 100% chance of occurrence in next year or has a recurrence interval of 10 years or less. Occasional: Between 1 and 10% chance of occurrence in the next year or has a recurrence interval of 11 to 100 years. Unlikely: Less than 1% chance of occurrence in next 100 years or has a recurrence interval of greater than every 100 years.		Magnitude/Severity (Extent) Catastrophic—More than 50 percent of property severely damaged; shutdown of facilities for more than 30 days; and/or multiple deaths Critical—25-50 percent of property severely damaged; shutdown of facilities for at least two weeks; and/or injuries and/or illnesses result in permanent disability Limited—10-25 percent of property severely damaged; shutdown of facilities for more than a week; and/or injuries/illnesses treatable do not result in permanent disability Negligible—Less than 10 percent of property severely damaged, shutdown of facilities and services for less than 24 hours; and/or injuries/illnesses treatable with first aid Significance Low: minimal potential impact Medium: moderate potential impact High: widespread potential impact		

L.3 Vulnerability Assessment

The intent of this section is to assess the Nipomo CSD's vulnerability separately from that of the County, which has already been assessed in Section 5 Hazard Identification and Risk Assessment (HIRA) in the Base Plan. This vulnerability assessment analyzes the population, property, and other assets (e.g. critical facilities) at risk to hazards ranked of medium or high significance that may vary from other parts of the planning area.

The key information to support the HIRA for this Annex was collected through a Data Collection Guide, which was distributed to each participating municipality, community services district, or special district to complete during the planning process. Information collected was analyzed and summarized in order to identify and rank all the hazards that could impact anywhere within the County, as well as to rank the hazards and identify the





related vulnerabilities unique to each jurisdiction/district. In addition, the Nipomo CSD planning team was asked to share information on past hazard events that have affected the District.

Each participating jurisdiction or district was in support of the main hazard summary identified in the Base Plan (See Table L.3). However, the hazard summary rankings for each jurisdictional annex may vary slightly due to specific hazard risk and vulnerabilities unique to that jurisdiction (see Table L.3). Identifying these differences helps the reader to differentiate the District's risk and vulnerabilities from that of the overall County.

Note: The hazard "Significance" reflects overall ranking for each hazard and is based on the Nipomo CSD planning team input from the Data Collection Guide and the risk assessment developed during the planning process (see Section 5 of the Base Plan), which included more detailed quantitative and qualitative analyses with best available data for all hazards in the County.

The hazard summaries in Table L.3 reflect the hazards that could potentially affect the District in major ways. Based on this analysis, the priority hazard (High Significance) for mitigation is Drought. The second priority hazards (Medium Significance) are Earthquake and Liquefaction. The discussion of vulnerability for each of the assessed hazards is contained in the following sections. Those of Medium or High significance for the Nipomo CSD are identified below.

- Drought
- Earthquake & Liquefaction
- Wildfire
- Human Caused Hazards: Hazardous Materials

Other Hazards

Hazards assigned a Significance rating of Low and which do not differ significantly from the County ranking (e.g., Low vs. High) will be profiled in a limited manner. In the Nipomo CSD, these include:

- Dam Incidents
- Flooding
- Landslide/Debris Flow

Additionally, the CSD's Committee members decided to rate several hazards as Not Applicable (N/A) to the planning area due to a lack of exposure, vulnerability, and no probability of occurrence. The following hazards are considered Not Applicable (N/A) to the Nipomo Community Services District.

- Adverse Weather
- Agricultural Pests and Plant Diseases
- Biological Agents
- Coastal Erosion
- Coastal Flooding and Inundation
- Hazardous Trees
- Land Subsidence
- Sea Level Rise
- Tsunamis and Seiches

L.3.1 Assets at Risk

This section considers the District's assets at risk, including values at risk, critical facilities and infrastructure, historic assets, economic assets, and growth and development trends.





Values at Risk

The following data on property exposure is derived from San Luis Obispo County Assessor's data. This data should only be used as a guideline to overall values in the Community Services District as the information has some limitations. Table L.4 Property Exposure Values for the Nipomo CSD by Parcel Type shows the exposure of properties (e.g., the values at risk based on improvement values, content values, and total values as an addition of these two types of values) broken down by property type for the Nipomo Community Services District. Refer to the Base Plan subsection 5.2 (HIRA Asset Summary) for more details on value information, content calculations, and overall parcel analysis methodology.

Table L.4 Property Exposure Values for the Nipomo CSD by Parcel Type

Property Type	Parcel Count	Improved Value	Content Value	Total Value
Agricultural	3	\$736,601	\$736,601	\$1,473,202
Commercial	60	\$51,059,866	\$51,059,866	\$102,119,732
Government/ Utilities	49	--	--	\$0
Other/Exempt/Misc.	132	\$13,106,704	--	\$13,106,704
Residential	3,327	\$785,708,738	\$392,854,369	\$1,178,563,107
Multi-Family Residential	182	\$55,234,041	\$27,617,021	\$82,851,062
Mobile/Manufactured Homes	289	\$22,766,514	\$11,383,257	\$34,149,771
Residential: Other	301	\$47,573,788	\$23,786,894	\$71,360,682
Vacant	40	\$9,130,020	--	\$9,130,020
TOTAL	4,383	\$985,316,272	\$507,438,008	\$1,492,754,280

Source: San Luis Obispo County 2019 Assessor data; ParcelQuest; Wood Plc analysis

Critical Facilities and Infrastructure

A critical facility is defined as one that is essential in providing utility or direction either during the response to an emergency or during the recovery operation. See Section 5 of the Base Plan for more details on the definitions and categories of critical facilities.

An inventory of critical facilities in the District based on San Luis Obispo County GIS data as well as structures obtained from the Homeland Infrastructure Foundation-Level Dataset (HIFLD) is provided in Table L.5 and Table L.6, and is illustrated in Figure L.2. The four types of Critical Facilities categorized by San Luis Obispo County and its jurisdictions' and districts' planning teams are: Emergency Services, High Potential Loss Facilities, Lifeline Utility Systems, and Transportation Systems. Refer to subsection 5.2 of the Base Plan for more information on the assets used throughout this Annex and the county-wide analyses.

**Table L.5 Summary of Nipomo CSD's Critical Facilities**

Facility Category	Facility Type	Count
Emergency Services	Day Care Facilities	2
	Emergency Medical Service Stations	1
	Fire Stations	1
	Private Schools	1
	Public Schools	4
Lifeline Utility Services	Water Treatment Facilities	1
TOTAL		10

Source: San Luis Obispo County Planning and Building; LAFCO; HIFLD; Wood Plc analysis

Table L.6 Details about Nipomo CSD's Critical Facilities

Facility Type	Name
Day Care Facilities	Dayspring Preschool
Day Care Facilities	Nipomo Recreation – Little Bits Preschool
Emergency Medical Service Stations	California Dept. of Forestry and Fire Protection Station 20 (Nipomo Fire Station)
Fire Stations	Station 20 (Nipomo Fire Station)
Private Schools	Highland Preparatory School
Public School	Central Coast New Tech High School
Public School	Dana Elementary School
Public School	Nipomo Elementary School
Public School	Nipomo High School
Water Treatment Facilities	Blacklake Waste/Treatment Water Facility

Source: San Luis Obispo County Planning and Building; LAFCO; HIFLD

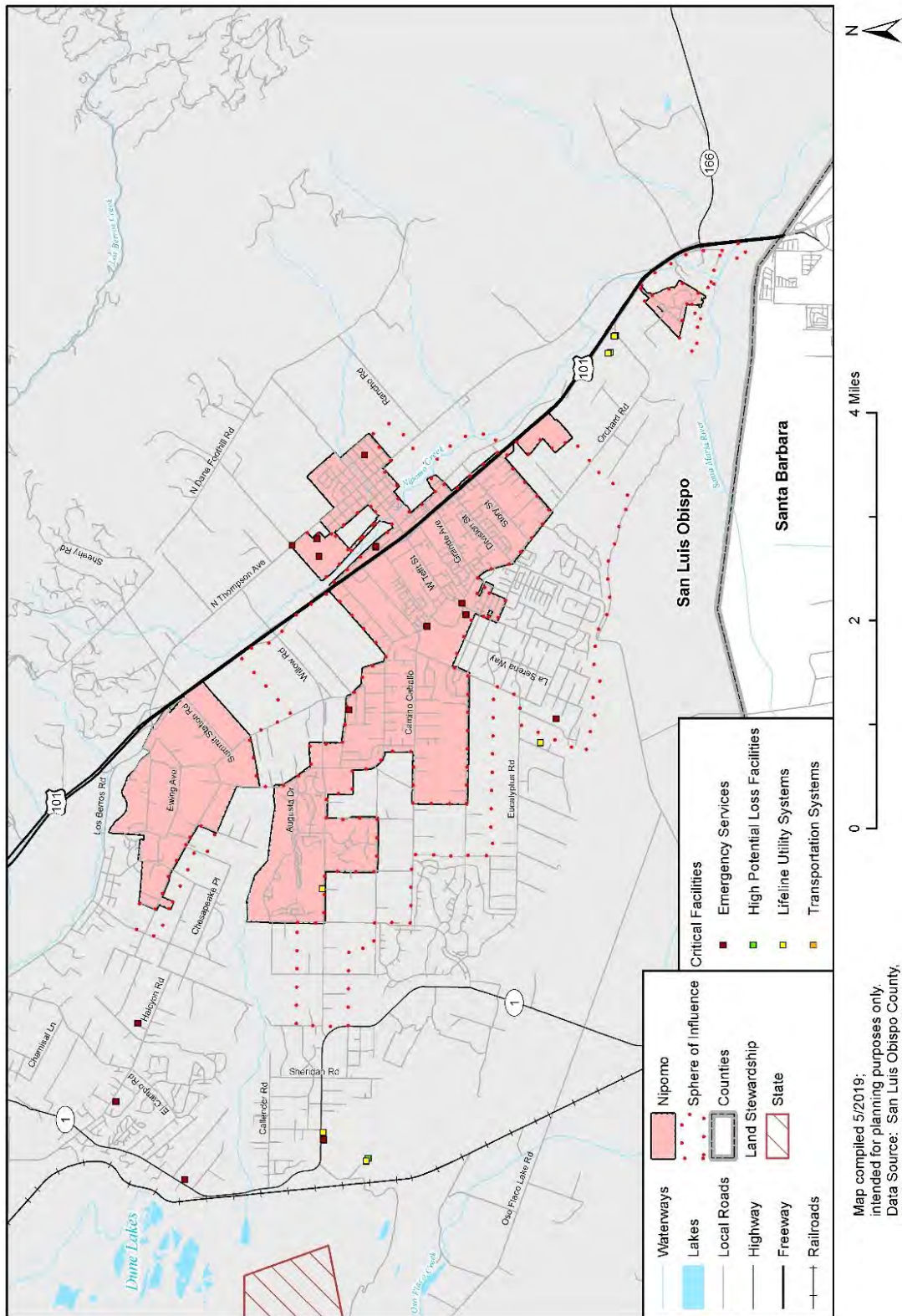
Additional Critical Facilities

Three additional Essential Infrastructure facilities identified by the District Planning Team are listed below under the Lifeline Utility Services category. In total the Nipomo CSD contains 13 critical facilities (including those 10 from the previous table):

- Wastewater Treatment Plan - \$18 million replacement value
- Water Treatment/Distribution facility - \$50 million replacement value
- Wastewater Treatment Plan - \$8 million replacement value



Figure L.2 Critical Facilities in the Nipomo CSD



Map compiled 5/2019:
intended for planning purposes only.
Data Source: San Luis Obispo County,
US Census TIGER Database, CA Open
Data Portal, BLM/California State Office,
LAFCO, HIFLD



Emergency Service Facilities

The Nipomo CSD contains nine Emergency Services facilities aimed at providing for the health and welfare of the entire community. These include day care facilities, emergency medical service stations, fire stations, and schools as noted Table L.5 and Table L.6.

Transportation Systems and High Potential Loss Facilities

No critical transportation facilities were noted for the District. However, there may be certain structures or entities important to the District, particularly along the main corridor running through Nipomo (Highway 101) or other major nearby transportation lines (e.g. Highway 1, Highway 166).

No high potential loss facilities such as power plants were identified by the County, HIFLD dataset, or the Planning Team. As will be noted under the Human Caused Hazards Section of this annex as well as in Section 5 of the Base Plan, several hazardous materials facilities are located in the District and there is a history of hazardous spills or incidents in/near the community.

Lifeline Utility Systems

A potential of four lifeline facilities have been identified for Nipomo. The Blacklake Waste/Treatment Water facility was obtained from the HIFLD national dataset (noted in Table L.6) while the other three were indicated by the Nipomo CSD Planning Team. Other facilities or structures falling within the lifeline utility systems category may be present in or nearby the District (e.g. oil/gas, electric power, communication systems), but those were not found to serve a critical purpose or function to the Nipomo community.

Historic and Cultural Resources

Historical assets include local, county, state, and potentially federally listed historic sites. Based on data provided by the County of San Luis Obispo and LAFCO, it was found that there are 7 historic and cultural resources in or near the Nipomo CSD. These are summarized in Table L.7.

Table L.7 Nipomo CSD's Historic and Cultural Resources

Area Plan Where Noted	Property Name	Year	Description
South County Inland Area Plan	Dana Adobe	1839	Historical Landmark No. 1033 (Rancho Nipomo)
	Dana House	1882	535 Mehlschau - http://www.danapowershouse.com
	Los Berros Adobe Barn	1860	159 Avis St
	Los Berros Schoolhouse	1890	1841 Grant Ave
	Old St. Joseph's Church	1902	110 Thompson Av
	Pacific Coast Railroad Depot	1881	right-of-way granted in 1881
	Runels Home - Dana Street	1886	now Kaleidoscope Inn & Gardens

Source: San Luis Obispo County Planning and Building; LAFCO

Natural Resources

Natural assets may include wetlands, threatened and endangered species, or other environmentally sensitive areas. Natural and environmental resources are important to include in benefit-cost analyses for future projects and may be used to leverage additional funding for projects that also contribute to community goals for protecting sensitive natural resources. Awareness of natural assets can lead to opportunities for meeting multiple objectives. For instance, protecting wetlands areas protects sensitive habitat as well as attenuates and stores floodwaters. The San Luis Obispo County Inland Area Plan was adopted in 2014. This larger plan comprises the Nipomo CSD as well as Nipomo's valley sub-basins within the Santa Maria Valley Groundwater



Basin, all in the South County sub-area plan. Based on information pulled from this South County sub-area plan, the Nipomo Mesa is an important destination for recreation that contributes to the local economic base, including construction of golf courses. The characteristics of the community mix urban appeal with rural features and lifestyles through development of site-sensitive treatment of scenic areas, parks, expansive biking and pedestrian infrastructure, and public and tourist-related transit that enhance quality of life. Based on these aspects, natural resources and environmental assets are undoubtedly key to the Nipomo community and should be carefully considered during development and planning efforts.

Economic Assets

Tourism is a large economic driver for the Nipomo community due to recreational and environmental assets as discussed in the above section. However, agriculture is important to the community as well, as are commercial, retail, and services. These types of economic assets could be compromised due to various hazards such as drought, flooding, earthquake, liquefaction, severe weather, and wildfire among others.

L.3.2 Estimating Potential Losses

This section details vulnerability to specific hazards of medium or high significance, where quantifiable, noted by the Planning Team, and/or where it differs significantly from that of the overall County. Impacts of past events and vulnerability to specific hazards are further discussed below, though refer to Section 5 of the Base Plan for more details on the County's HIRA findings and hazard profiles.

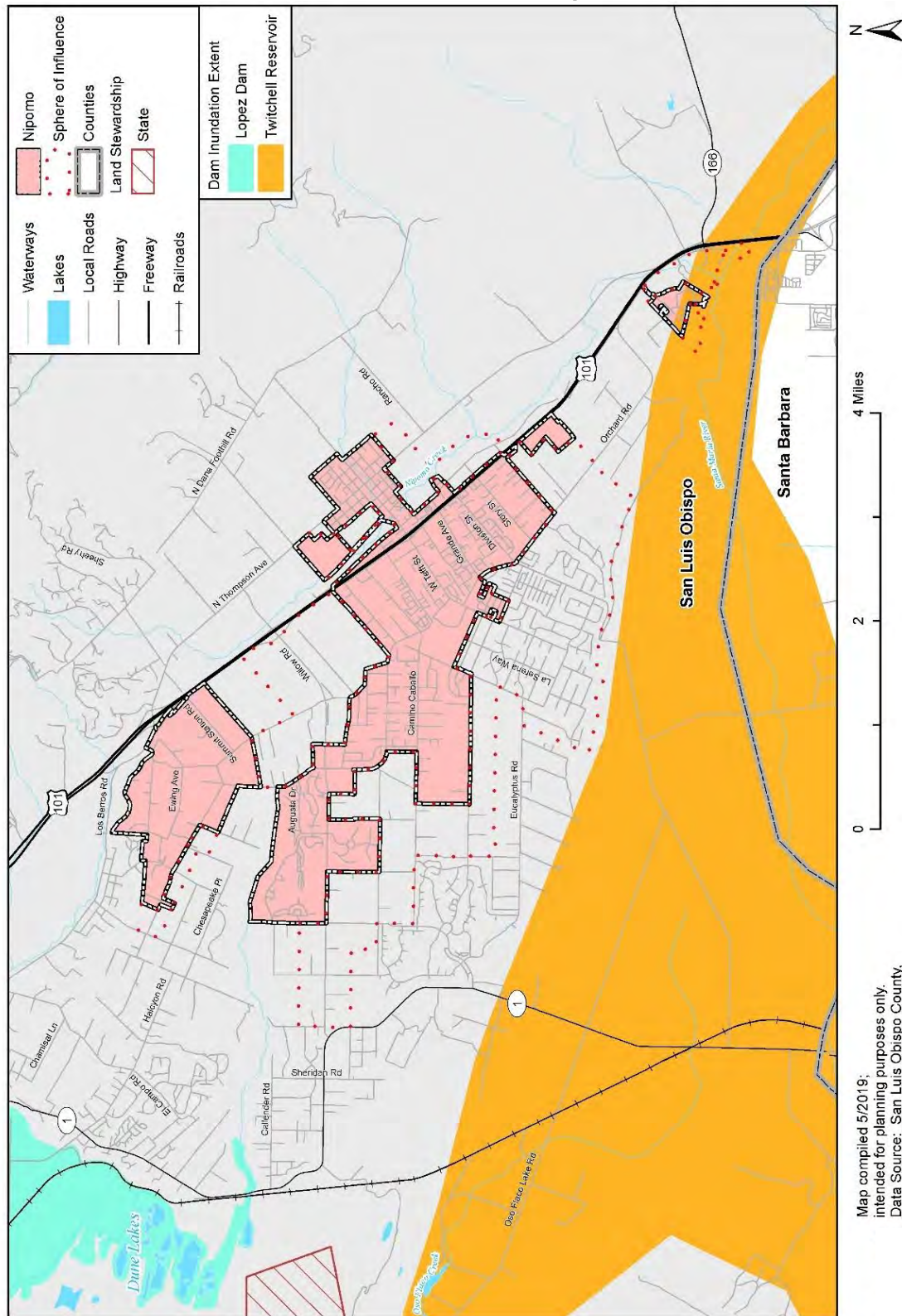
Dam Incidents and Failure

The Nipomo CSD is at risk of dam failure incidents based on its location downstream of the Twitchell Reservoir Dam. The Twitchell Dam is a high hazard earthen dam located just southeast of Nipomo, within Santa Barbara County and flowing into San Luis Obispo County on its southwest corner. If this dam were to fail and flood through the Santa Maria River into Nipomo, it would inundate the southeast corner of the District around the intersection of Highway 101 and Highway 166 (see Figure L.3). Note that this figure also depicts the nearby inundation of the Lopez Dam, which reaches the Dune Lakes on the northwest of Nipomo but does not quite reach the District.





Figure L.3 Dam Inundation of the Twitchell Dam in the Nipomo CSD



Map compiled 5/2019;
intended for planning purposes only.
Data Source: San Luis Obispo County,
US Census TIGER Database, CA Open
Data Portal, BLM/California State Office,
LAFCO, NID 2018, CA DWR



Though failure of the Lopez Dam is not expected to reach the Nipomo CSD, a major severe weather, local flooding event, or other existing hazard incident combined with dam inundation could possibly reach the community and cause unexpected damage. However, it is inundation caused by a potential unscheduled release or failure of the Twitchell Dam that would be of higher concern to the District given the mapped extents shown on Figure L.3 and based on the loss estimates summarized in Table L.8 below.

Table L.8 Estimated Losses by Property Type in Nipomo CSD based on Twitchell Dam Inundation Extents

Property Type	Parcel Count	Improved Value	Content Value	Total Value	Loss Estimate	Population at Risk
Other/Exempt/Miscellaneous	5	--	--	\$0	\$0	--
Residential	44	\$16,446,047	\$8,223,024	\$24,669,071	\$12,334,535	110
TOTAL	49	\$16,446,047	\$8,223,024	\$24,669,071	\$12,334,535	110

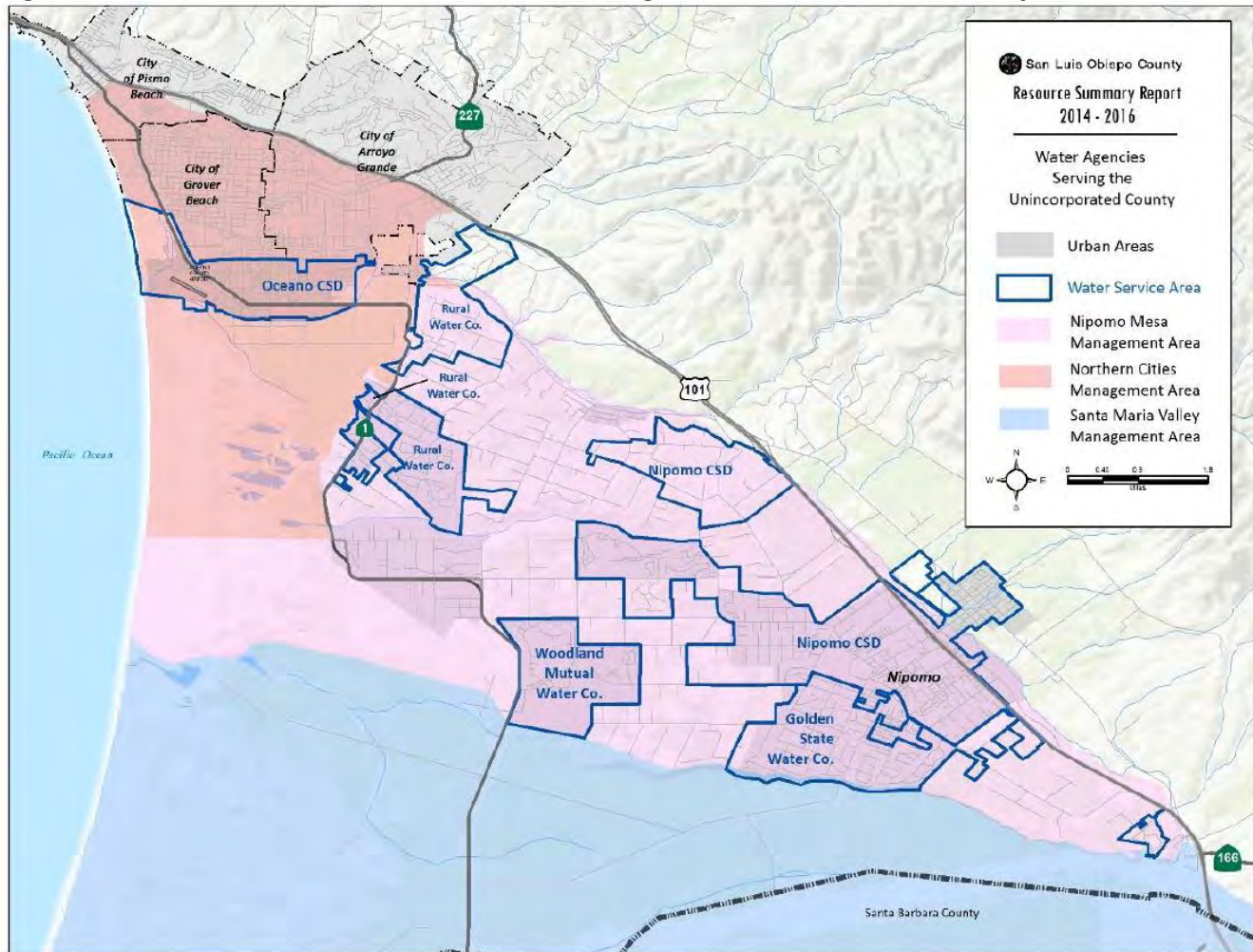
Source: San Luis Obispo County Planning and Building Dept., Assessor's Office, ParcelQuest, Wood Plc Parcel Analysis

Based on the above information, a total of 110 persons and 49 properties may be inundated if the Twitchell Dam was to fail. It would be expected that 44 of these properties would be of type "residential" while 5 may be miscellaneous or exempt. Refer to subsection 5.3.8 Dam Incidents of the Base Plan for additional details on this hazard and estimated losses across the County. There are no critical facilities within Nipomo that would be at risk of this dam possibly failing.

A failure of the Twitchell Dam could also affect Highway 101 and several local roads, possibly impeding or reducing flows of goods, people and resources and hence having some impact across the District. There have been no past dam incidents or failures in the District, so this dam incidents and failure hazard could be rated as holding **Low Significance** to the District due to the vulnerability shown on the previous analysis and mapping.

Drought and Water Shortage

Nipomo is located in the Santa Maria Groundwater Basin, within the Nipomo Mesa Management Area (see Figure L.4). As noted previously in this annex, the Nipomo CSD has dealt with issues of drought and water shortage in the past, which led to the acquisition of supplemental sources from Santa Maria, for example. This project hopes to push water capacity to 3,000 Acre-Feet per Year (AFY) to reduce usage from groundwater sources on somewhat depleted aquifers and basins, as one of the District's core vision statements is to provide customers with reliable and cost-effective water now and in the future. The Nipomo CSD's Water Shortage Response and Management Plan was created also with a key goal of enhancing the District's abilities to respond to drought and other water supply emergencies, and hence continue being sustainable though the years when it comes to this precious water resource.

**Figure L.4 Santa Maria Groundwater Basin, Management Areas, and Water Purveyors**

Source: San Luis Obispo County 2014-2016 Resource Management Report

In present day, drought and water shortages pose a risk to the community and the services provided by the Nipomo CSD. Table L.9 was obtained from the San Luis Obispo County 2014-2016 Resource Management Report and shows the existing and forecasted water supply and demand for the five water purveyors within the Santa Maria Groundwater Basin of which the Nipomo CSD is part. Drought impacts are wide-reaching and may be economic, environmental, and/or societal. As noted in the table below, in addition, water demand projected over 15 years is expected to equal or exceed the estimated dependable supply.

**Table L.9 Nipomo Mesa Management Area Existing and Forecasted Water Supply and Demand**

Table II-17 -- Santa Maria Groundwater Basin – Nipomo Mesa Management Area Existing and Forecasted Water Supply and Demand					
Demand	Nipomo CSD	Woodlands Mutual Water Co.	Golden State Water Co.	Agriculture	Rural
FY 2015/2016 Demand (AFY) ¹	1,773.3	732.1	625.1	7,337	2,878 ²
Forecast Demand in 15 Years (AFY)	3,995	1,386 ⁶	1,690	7,575	5,222
Forecast Demand in 20 Years (AFY)	4,103	1520 ⁶	1,847	8,291	5,661
Buildout Demand (30 Or More Years) (AFY)	4,244 ³	1520 ^{4, 6}	1,944	8,291	5,661
Supply					
Nipomo Supplemental Water Project (AFY) ⁵	2,237	417	208	0	0
Santa Maria Groundwater Basin -- Nipomo Mesa Sub-Area (AFY)	1,000	817	852	7,482	2,095
San Luis Obispo Valley Groundwater Basin	0	0	0	809	226
Other GW Supplies	0	0	0	0	0
Recycled Water (AFY)	60-74	200	0	0	0
Total Supply:	3,311	1,434	1,060	8,291	5,661
Water Supply Versus Forecast Demand	Water demand projected over 15 years is projected to equal or exceed the estimated dependable supply. ⁴				

Notes: 1. See Table II-1. Current year data for agriculture is from the Nipomo Management Area 2015 Annual Report. 2. Nipomo Mesa Management Area 2015 Annual Report. 3. Nipomo CSD 2015 Urban Water Management Plan. 4. Ten percent additional water conservation (beyond what has already been accomplished) assumed for the low end of the forecast buildout demand, except for Grover Beach, which assumed 20% additional reduction. 5. Nipomo supplemental water project includes Nipomo CSD, Woodlands MWC, Golden State Water Company, and Rural Water Company. Nipomo CSD will receive approximately 1,667 AFY and has reserved an additional 500 AFY. The other three will receive 833 AFY. 6. The NCMA cities, NMMA cities, County, District, and local land owners actively and cooperatively manage surface and groundwater with the goal of preserving the long-term integrity of water supplies in the NCMA and NMMA. 7. Demands are based on an 18-hole golf course constructed in Phase IIA/IIB. Projected demands may be reduced if the open space is planted with vineyards or drought tolerant landscaping in lieu of the golf course.

Source: San Luis Obispo County 2014-2016 Resource Management Report

Drought was classified by the Planning Team as the most significant hazard for Nipomo, just as it is a **High Significance** hazard for the entire County of San Luis Obispo. The most notable impacts associated with drought in the planning area are those related to water intensive activities such as wildfire protection, jurisdictional usage, commerce, tourism and recreation. During past drought events and due to new water source acquisitions in the planning area, water restrictions and increased water rates have been imposed, while water savings are always encouraged. For example, beginning 2014 there was a 30% water reduction restriction mandated by the State of California which affected the District; during this time of drought, groundwater table damages were identified in Nipomo. Drought conditions can also cause soil to compact and not absorb water well, potentially making an area more susceptible to flooding, erosion, and debris flows. One recommended action from the San Luis Obispo County 2014-2016 Resource Summary Report related to the Nipomo CSD is that the District work



with the County's Sanitation District and other local stakeholders to improve water supply reliability and move towards the use of recycled water to meet future demands.

Earthquake and Liquefaction

Nipomo sits on an ancient sand dune, and there are several faults underlying or near the District, such as the San Luis Range fault system/South Margin faults and the Santa Maria Fault. (See a very basic layout of the District and surrounding faults in Figure L.5.) Because of earthquake, coupled with liquefaction (both of which are discussed in more detail in subsection 5.3.10 of the Base Plan) and earth movement issues, the Planning Team for the District noted that its infrastructure is prone to severe or even catastrophic failure from seismic activities. However, recent efforts to construct well-deigned above ground structures has resulted in greater focus on earthquake survivability for critical and essential infrastructure and properties.

For example, the District built the Joshua Road Reservoir in 2017 (a post stressed designed concrete water storage structure), and it was constructed with the ability to withstand a severe earthquake during its 100-year life cycle. In addition, as with many public and municipal structures across the County, Nipomo's above ground facilities are built with a high degree of resilience and capability to withstand earthquakes. Underground facilities are less vulnerable in these environments, as flexibility of pipelines and valves in sand have limited distribution system failures during seismic activities. Nevertheless, the Planning Team noted that the original distribution systems off the ancient dunes east of Highway 101 in Nipomo would be the most vulnerable to earthquakes and would be expected to experience greater rates of failure due to the soil types in which they are found as well as the pipeline bedding practices exercised by the early District design engineers. In addition, the District's Southland and Blacklake wastewater facilities are typical above-ground facilities that are susceptible to earthquakes and would experience measurable damage consistent with the strength of an earthquake, so that the greater the quake the greater the degree of damage to these. The Southland facility was rebuilt in 2014 and incorporates modern engineering standards to better withstand earthquakes, while Blacklake, built in 1984, is more vulnerable to damage caused by an earthquake due to its age and design.

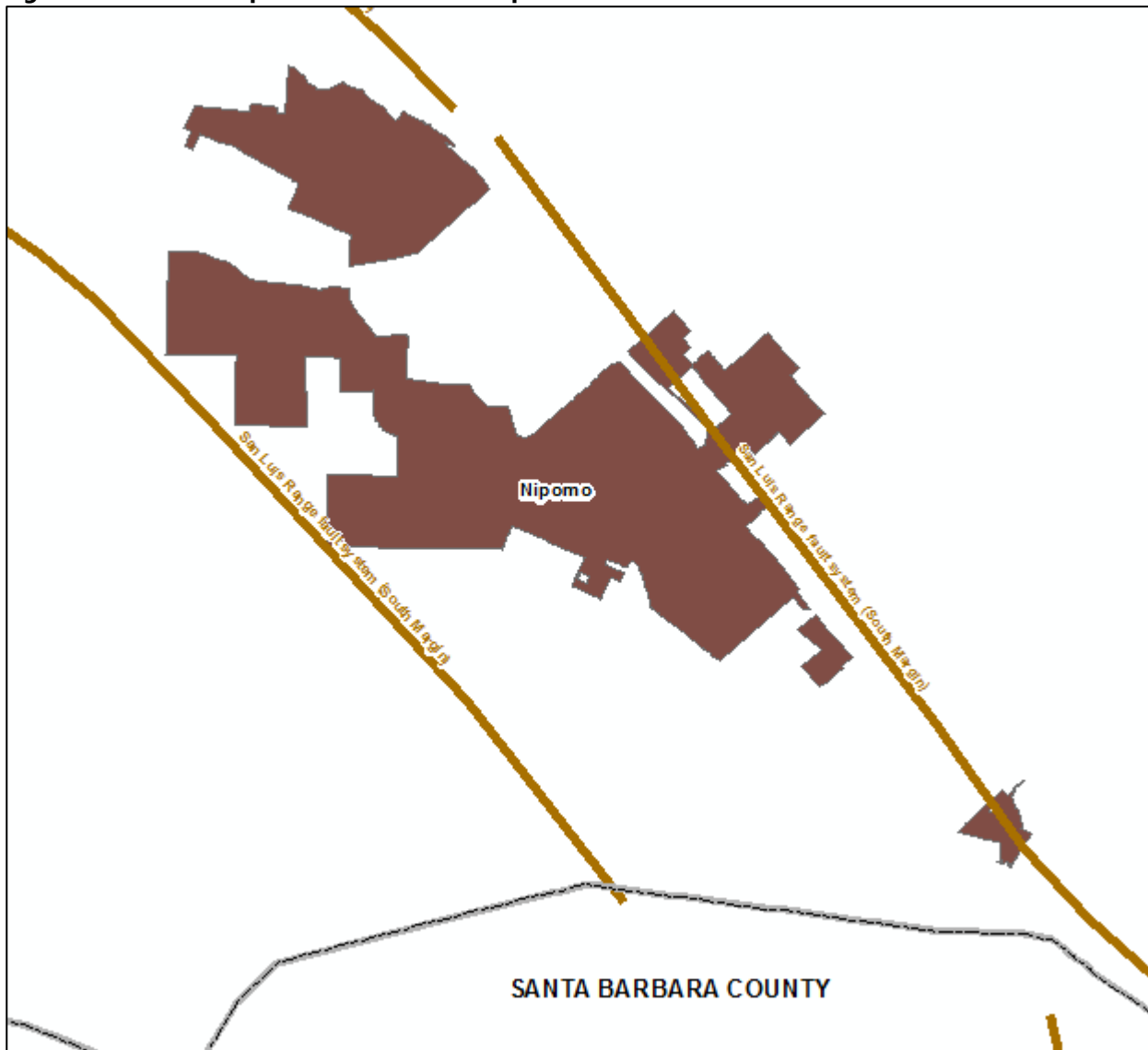
Because of the recent and ongoing efforts and projects in Nipomo, as well as the inherent understanding of the Planning Team regarding seismic activity and the District's infrastructure, the earthquake and liquefaction hazards can be rated as **Medium Significance** even though the County of San Luis Obispo rated it as high significance.

In terms of liquefaction, the Nipomo CSD is almost completely covered by liquefiable soils that are rated as posing moderate risk. The portion of the District that falls to the east of Highway 101 (near N. Thompson Ave and north of Nipomo Creek) is only found to be at low risk of this hazard, though high risk liquefaction potential is found surrounding the District to the south, southeast, and west. See Figure L.6 for reference on liquefaction risk.



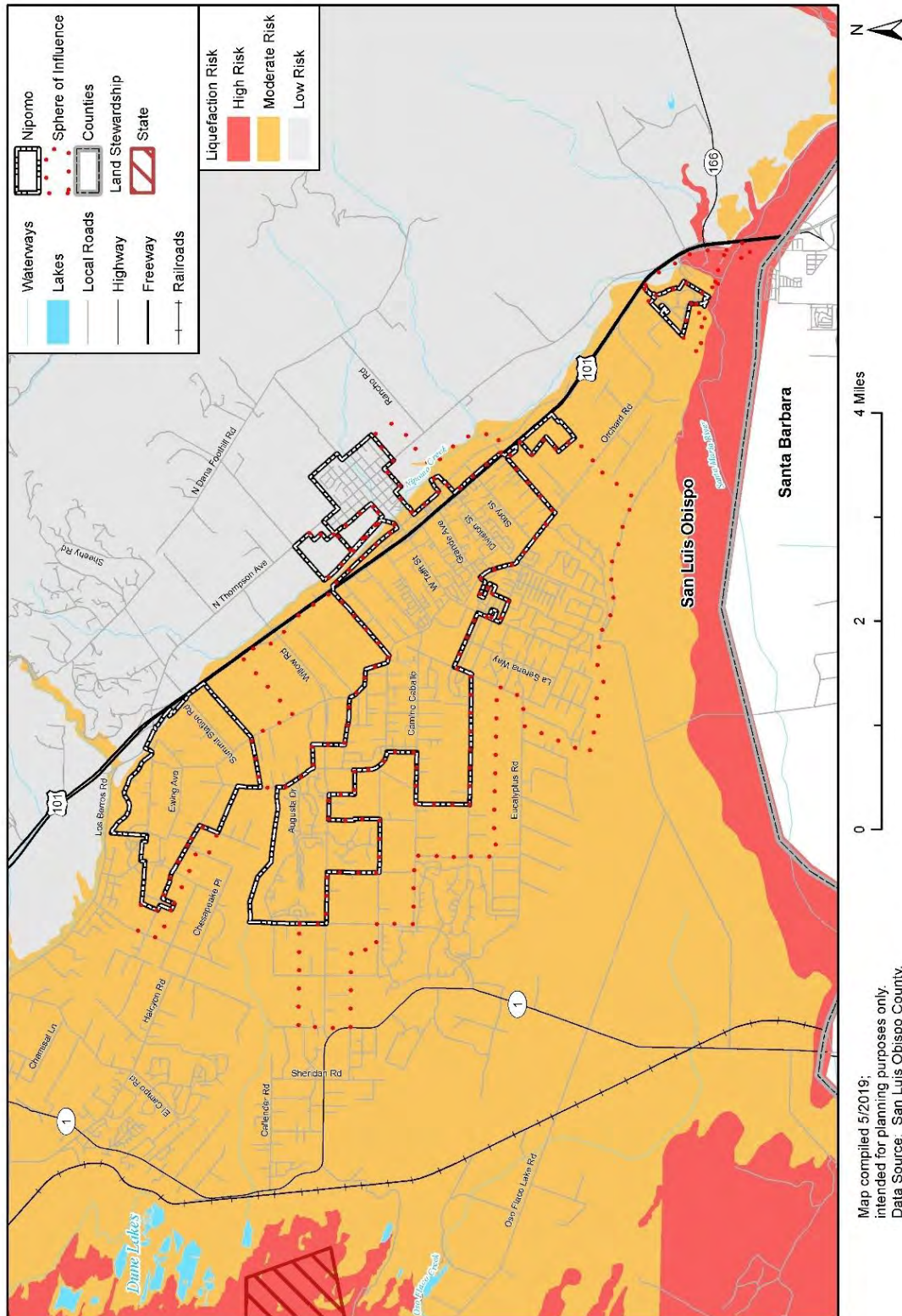
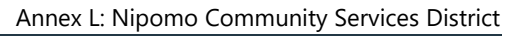


Figure L.5 Earthquake Fault near the Nipomo CSD



Source: USGS; San Luis Obispo County Planning and Building; LAFCO





Map compiled 5/2019;
intended for planning purposes only.
Data Source: San Luis Obispo County,
US Census TIGER Database, CA Open
Data Portal, BLM/California State Office, LAFCO,



GIS overlay analysis was performed on the parcel and liquefaction risk data for the County of San Luis Obispo and refined for the Nipomo CSD to quantify how many parcels (and their improved and content values) were exposed and hence vulnerable to liquefaction hazards. The loss estimates calculated for the Nipomo CSD based on property type are summarized in Table L.10 for moderate liquefaction risk (as no other liquefaction risk category affects the District's properties). Based on this assessment, 3,590 parcels are at risk of this hazard with most of them falling in the residential category, followed by other/exempt/miscellaneous, commercial, vacant, government/utilities, and agricultural. The total parcel value at risk surpasses the \$1.3 billion mark.

Table L.10 Loss Estimates from Liquefaction Risk in the Nipomo CSD – Moderate Risk

Property Type	Parcel Count	Improved Value	Content Value	Total Value
Agricultural	3	\$736,601	\$736,601	\$1,473,202
Commercial	39	\$45,215,073	\$45,215,073	\$90,430,146
Government/Utilities	28	--	--	\$0
Other/Exempt/Misc.	119	\$11,854,581	--	\$11,854,581
Residential	2,691	\$688,463,179	\$344,231,590	\$1,032,694,769
Multi-Family Residential	142	\$50,140,963	\$25,070,482	\$75,211,445
Mobile/Manufactured Homes	284	\$22,109,614	\$11,054,807	\$33,164,421
Residential: Other	245	\$39,655,572	\$19,827,786	\$59,483,358
Vacant	39	\$8,866,622	--	\$8,866,622
TOTAL	3,590	\$867,042,205	\$446,136,338	\$1,313,178,543

Source: San Luis Obispo County Planning and Building Dept., Assessor's Office, ParcelQuest, Wood Plc Parcel Analysis

With regards to critical facilities, the Nipomo CSD contains eight that are at moderate risk of liquefaction. These are noted in Table L.11. No critical facilities are found in high liquefaction risk areas.

Table L.11 Critical Facilities in Moderate Liquefaction Risk in the Nipomo CSD

Critical Facility Type	Critical Facility Total
Day Care Facilities	2
Emergency Medical Service Stations	1
Fire Stations	2
Private Schools	1
Public Schools	1
Water Treatment Facility	1
TOTAL	8

Source: San Luis Obispo County Planning and Building Dept., HIFLD, LAFCO, Wood Plc Parcel Analysis

Flood

The Nipomo CSD falls within the County of San Luis Obispo's Water Planning Area 3, which corresponds to the San Luis Obispo/South County zone. Within this zone, Nipomo is located in the Nipomo Creek/Santa Maria River watershed. Nipomo is at risk of riverine flooding based on the Federal Emergency Management Agency (FEMA) data last updated for San Luis Obispo County in February of 2019.

Nipomo Creek, which crosses the District in a north/south fashion following Highway 101 to the east of the community boundaries, is the main source of flooding affecting Nipomo. The Santa Maria River to the south and minor tributaries to the Nipomo Creek such as Deleissigues Creek and Mehlschau Creek also contribute to the



flood hazard areas, though in more minor ways (see Figure L.7). The majority of the District areas at risk of flooding would be affected by the 100-year floodplain (i.e. 1% annual chance flood event), near the Tefft St and N Thompson Ave area. Smaller areas are at risk of the 500-year floodplain (i.e. 0.2% annual chance flood event), also located in the portion of the District located to the east of Highway 101.

Levees

There is one levee to provide flood protection and hence reduce the risk to people and structures near Nipomo, per the San Luis Obispo County Dam and Levee Failure Evacuation Plan completed in 2016. The Santa Maria River Levee is currently owned and operated by the Santa Barbara Department of Public Works' Flood Control District. The San Luis Obispo County's Flood Control District provides some funding towards the maintenance of the levee as part the minor flood control Zone 4 for which it is responsible. Zone 4 collects service fees from properties in San Luis Obispo County that receive flood protection from the levees (including portions of Nipomo), and reimburses the Santa Barbara District for its maintenance services. This levee runs along the Cuyama River, which would be affected by the Twitchell Dam were the dam to fail or inundate downstream communities. The Santa Maria River Levee is built of river sand and parts of it are additionally protected by a layer of rock. However, this levee is not certified by the U.S. Army Corps of Engineers (USACE) to withstand a 100-year flood, and a recent inspection of the structure by USACE forced this levee to be placed on the national list of levees at risk of failure.





Map compiled 5/2019;
intended for planning purposes only.
Data Source: San Luis Obispo County.

Map compiled 5/2019;
intended for planning purposes only.
Data Source: San Luis Obispo County,
US Census TIGER Database, CA Open
Data Portal, BLM/California State Office,
LAFCO, FEMA NFHL



Based on GIS overlay analysis of the flood hazard areas for the 100- and 500-year floodplains as well as the parcel data, it was found that 233 parcels were found to be within these hazard layers, as summarized in Table L.12 and Table L.13. While it is possible that fewer parcels are at risk of the 100-year flood event due to mitigation having taken place and the properties having been built to code (so that future flooding will not affect them), this information was not available and cannot be confirmed. But it is likely that more parcels are found to be at risk of the 500-year flood event due to not being built following California's code guidelines, which only regard those properties in the 100-year floodplain. It should be noted that only minor riverine flooding events have affected the Nipomo CSD to date, and so this hazard was rated as having **Low Significance** by the San Luis Obispo County Planning Team for the County as a whole based on potential risk to life and property. For more details on flooding hazards in terms of background information or analysis results for the entire County, refer to subsection 5.3.11 of the Base Plan.

Properties at Risk

Table L.12 Parcels in 100-Year Flood Hazard Areas in the Nipomo CSD

Property Type	Parcel Count	Improved Value	Content Value	Total Value	Loss Estimate	Population
Commercial	12	\$4,243,935	\$4,243,935	\$8,487,870	\$2,121,968	--
Government/ Utilities	4	--	--	\$0	\$0	--
Other/Exempt/ Miscellaneous	7	\$1,042,437	--	\$1,042,437	\$260,609	--
Residential	49	\$5,133,482	\$2,566,741	\$7,700,223	\$1,925,056	123
Multi-Family Residential	8	\$1,472,719	\$736,360	\$2,209,079	\$552,270	20
Residential: Other	23	\$2,910,462	\$1,455,231	\$4,365,693	\$1,091,423	58
TOTAL	103	\$14,803,035	\$9,002,267	\$23,805,302	\$5,951,325	201

Source: San Luis Obispo County Planning and Building Dept., Assessor's Office, ParcelQuest, FEMA NFHL, Wood Plc Parcel Analysis

Table L.13 Parcels in 500-Year Flood Hazard Areas in the Nipomo CSD

Property Type	Parcel Count	Improved Value	Content Value	Total Value	Loss Estimate	Population
Commercial	8	\$1,488,840	\$1,488,840	\$2,977,680	\$744,420	--
Government/ Utilities	5	--	--	\$0	\$0	--
Other/Exempt/ Miscellaneous	4	\$53,867	--	\$53,867	\$13,467	--
Residential	59	\$6,518,049	\$3,259,025	\$9,777,074	\$2,444,268	148
Multi-Family Residential	21	\$2,629,090	\$1,314,545	\$3,943,635	\$985,909	53
Residential: Other	33	\$5,007,754	\$2,503,877	\$7,511,631	\$1,877,908	83
TOTAL	130	\$15,697,600	\$8,566,287	\$24,263,887	\$6,065,972	284

Source: San Luis Obispo County Planning and Building Dept., Assessor's Office, ParcelQuest, FEMA NFHL, Wood Plc Parcel Analysis





Nipomo does not participate separately in the National Flood Insurance Program (NFIP) but will continue to support the County's participation in and compliance with the NFIP.

Population at Risk

As shown in the two tables above, it is estimated that 485 people could be at risk of riverine flooding hazards based on the number of residential parcels which overlay with the 100- and 500-year floodplains. These population totals were found by multiplying the average household values in the County of San Luis Obispo (2.51 persons per home) by the number of residential properties in each of the property type categories, assuming that other property types (e.g. commercial, government) would likely not be populated. The majority of the population at risk is found within the 500-year floodplain, to the east of Highway 101 near the intersection area of N Thompson Ave and Tefft Street.

Critical Facilities at Risk

Only one critical facility was found to overlap with floodplains in the Nipomo CSD. This is a public school (Nipomo High School) falling within the 500-year floodplain, located right off of N. Thompson Avenue.

Back in March of 2001 a heavy rain event that produced numerous flooding occurrences across San Luis Obispo County happened to affect Nipomo. Several small, local streams flooded, damaging 20 to 30 homes.

Landslides and Debris Flow

Landslide and debris flow hazards have been rated by the Nipomo Planning Team as a **Low Significance** hazard. This is because most of the Nipomo CSD and its sphere of influence contains very limited medium to high potential landslide risk areas. Figure L.8 displays these landslide potential areas across the CSD and its sphere of influence. As shown in the figure, small portions around the north and northwest limits of the CSD and its sphere of influence are affected by moderate landslide potential, as are the southmost tip of the detached portion of the CSD that is close to the Santa Maria River. The south portion of the District's sphere of influence crosses small parts of high landslide potential, along Riverside Road and north/northwest of Division Street and Oso Flaco Lake Road.

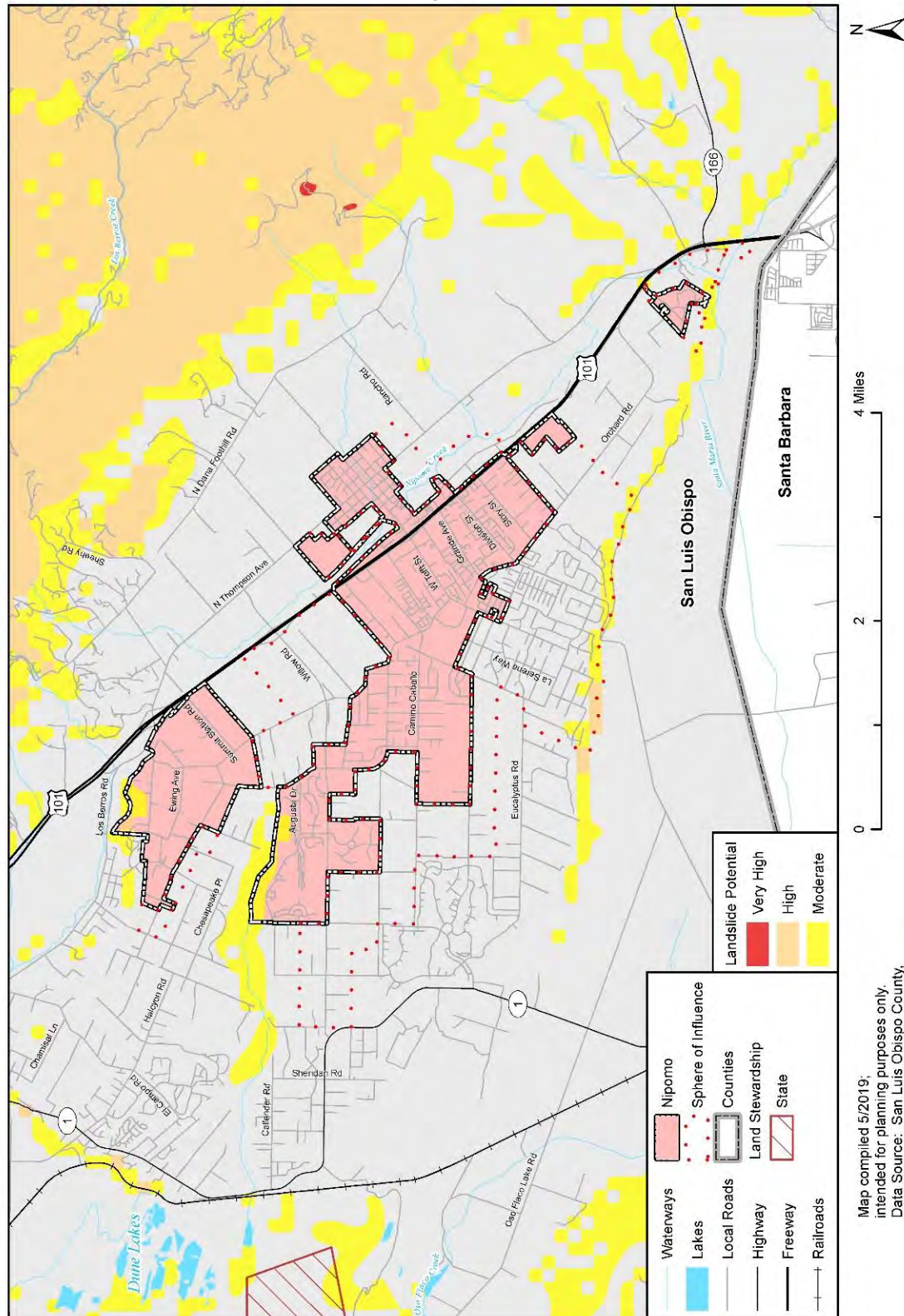
While no previous hazard occurrences have been noted for Nipomo, based on historical data for the County and given the presence of landslide-susceptible geology and steep slopes nearby, landslide hazards are likely to continue on an annual basis, though damaging landslides are not expected for the District. However, GIS overlay analysis of these landslide potential layers and the parcel data broken by type show that 19 parcels (6 of type other/exempt/miscellaneous and 13 residential parcels) are at risk of moderate landslides in Nipomo, while 1 residential parcel is at risk of high landslide potential. Figure L-8 summarizes this parcel information including loss estimates for those properties found in both moderate and high landslide potential zones. No critical facilities are found to overlap with landslide potential areas across Nipomo.

A moderate to major possible landslide event along Highway 101, or an event which affected this major road into or out of the CSD, could have serious impacts on both visitors and locals in terms of road closures or maintenance. For more details on the landslide and debris flow hazards in terms of background information or analysis results for the entire County, refer to subsection 5.3.12 of the Base Plan.





Figure L.8 Landslide Potential Areas in the Nipomo CSD



**Table L.14** Parcels in Moderate and High Landslide Potential Areas in the Nipomo CSD

Landslide Potential	Parcel Type	Parcel Count	Improved Value	Content Value	Total Value
Moderate	Other/Exempt/Miscellaneous	6	\$5,000	--	\$5,000
	Residential	13	\$4,060,974	\$2,030,487	\$6,091,461
TOTAL		19	\$4,065,974	\$2,030,487	\$6,096,461
High	Residential	1	\$324,185	\$162,093	\$486,278
TOTAL		1	\$324,185	\$162,093	\$486,278
GRAND TOTAL		20	\$4,390,159	\$2,192,580	\$6,582,739

Source: San Luis Obispo County Planning and Building Dept., Assessor's Office, ParcelQuest, LAFCO, Wood Plc Parcel Analysis

Wildfire

The County of San Luis Obispo overall rated wildfire as a high hazard due to history of occurrence and threat exposure. While there is no recent fire history in the Nipomo CSD, due to factors such as the coverage of high fire hazard severity zones in about half of Nipomo and its sphere of influence as well as parcel analysis results, wildfire was ranked as a **Medium Significance** hazard in the District. From the year 1900 to 2018, five wildfire incidents did occur within the boundaries of Nipomo. These are listed in Table L.15. The cause of the each of the fires summarized below is not known or unidentified.

Table L.15 Wildfire Incidents in the Nipomo CSD from 1900 to 2018

Fire Name	Year	Approximate Acres Burned
Flintkote	1957	380
Willow Road	1970	392
Willow Road	1976	937
Slu-730	1987	7,733
Mesa	1993	345
TOTAL		9,787

Source: San Luis Obispo County Planning and Building Dept., LAFCO, CalFire, Wood Plc Parcel Analysis

Properties at Risk

CalFire fire hazard severity studies show the following categories of fire severity in State Responsibility Areas (SRAs) for Nipomo (see Table L.16 and Figure L.9). The majority of the parcels at risk are found within the high fire hazard severity zone, to the west of Highway 101 and on the northern half of the CSD and its sphere of influence.

**Table L.16** **Parcels in Moderate and High Fire Hazard Severity Zones in the Nipomo CSD**

Fire Hazard Severity Zone	Parcel Type	Parcel Count	Improved Value	Content Value	Total Value	Loss Estimate	Population at Risk
Moderate	Mobile/Manufactured Homes	2	\$73,970	\$36,985	\$110,955	\$110,955	5
	Residential	2	\$257,929	\$128,965	\$386,894	\$386,894	5
TOTAL		4	\$331,899	\$165,950	\$497,849	\$497,849	10
High	Agricultural	2	\$170,670	\$170,670	\$341,340	\$341,340	--
	Government/Utilities	9	--	--	\$0	\$0	--
	Other/Exempt/Miscellaneous	9	\$736,845	--	\$736,845	\$736,845	--
	Residential	410	\$136,180,705	\$68,090,353	\$204,271,058	\$204,271,058	1,029
	Multi-Family Residential	5	\$1,147,426	\$573,713	\$1,721,139	\$1,721,139	13
	Mobile/Manufactured Homes	26	\$4,346,325	\$2,173,163	\$6,519,488	\$6,519,488	65
	Vacant	13	\$1,714,510	--	\$1,714,510	\$1,714,510	--
TOTAL		474	\$144,296,481	\$71,007,898	\$215,304,379	\$215,304,379	1,107
GRAND TOTAL		478	\$144,628,380	\$71,173,848	\$215,802,228	\$215,802,228	1,117

Source: San Luis Obispo County Planning and Building Dept., Assessor's Office, ParcelQuest, LAFCO, CalFire, Wood Plc Parcel Analysis

Population at Risk

As shown in the table above, it is estimated that 1,117 people could be at risk of fire related hazards based on the number of residential parcels which overlay with the moderate and high fire hazard severity zone layers. These population totals were found by multiplying the average household value in the County of San Luis Obispo (2.51 persons per home) by the number of residential properties in each of the property type categories, assuming that other property types (e.g. commercial, industrial) would likely not be populated. A total of 1,107 people's homes are found in the very high fire hazard severity zones, while only 10 are found in the moderate fire hazard severity zones.

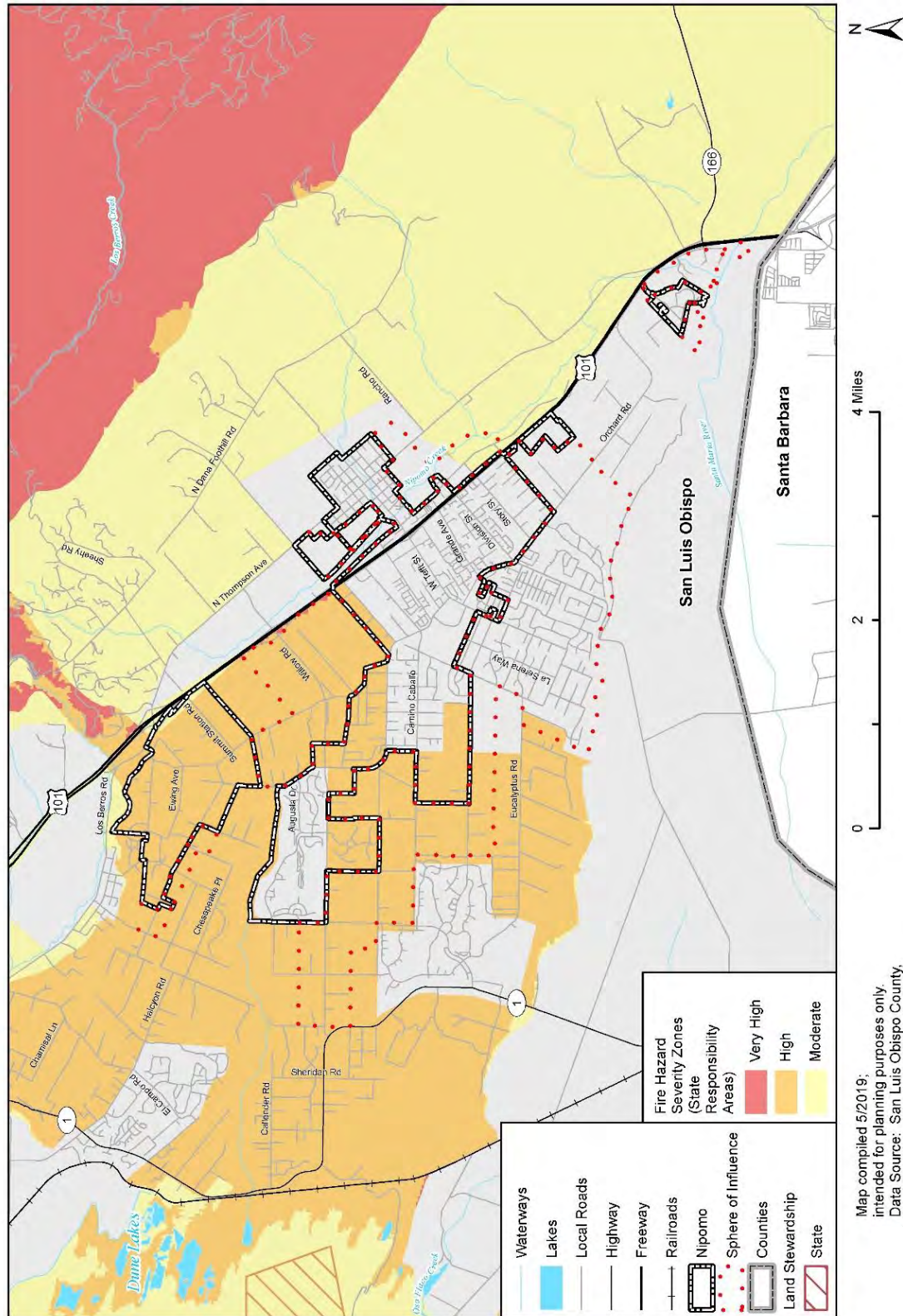
Critical Facilities at Risk

Only one school is found within fire severity zones in Nipomo. This is a private school (Highland Preparatory School) located to the west of Highway 101, off Live Oak Ridge Road.





Figure L.9 Fire Hazard Severity Zones in the Nipomo CSD



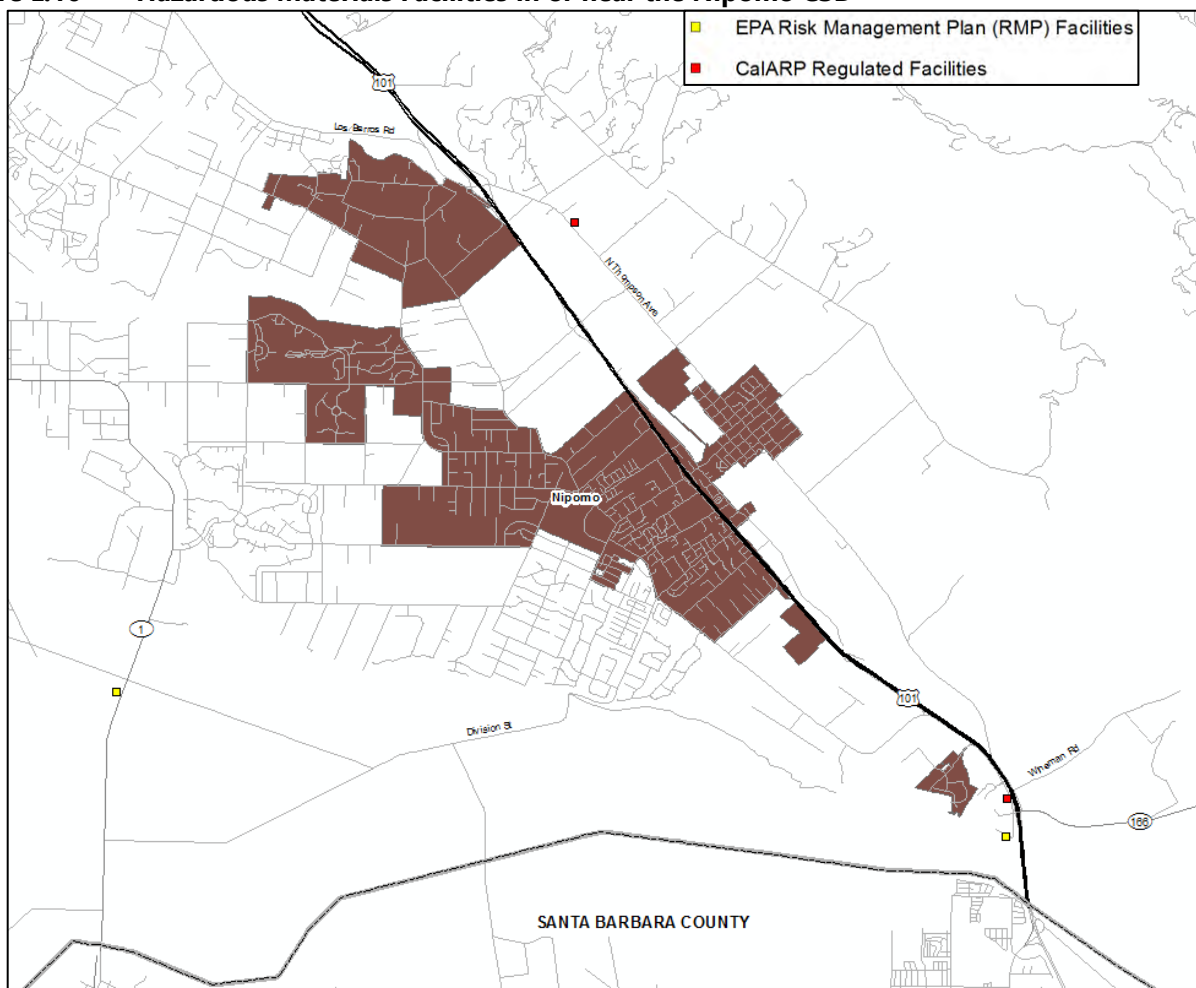
Map compiled 5/2019:
intended for planning purposes only.
Data Source: San Luis Obispo County,
US Census TIGER Database, CA Open
Data Portal, BLM/California State Office,
LAFCO, CalFire



Human Caused: Hazardous Materials

The Nipomo CSD has a history of hazardous material incidents. The Cal OES Warning Center reports 58 hazardous materials incidents in the Nipomo CSD from 1994 through October 24, 2018; as noted in subsection 5.3.16 HazMat of the Base Plan, this likely excludes a large number of unreported minor spills. (Cal OES reports an additional 209 incidents in unincorporated San Luis Obispo County, however a lack of details on this data makes it difficult to know if any of those took place within the CSD boundaries, given there is no spatial component to it.) This constitutes 3% of the hazardous materials incidents reported county-wide during the same time frame, which averages out to roughly 2.3 incidents per year. As noted in subsection 5.3.16, only around 6% of reported hazardous materials incidents result in injuries, fatalities, or evacuations. As shown in Figure L.10, there are two EPA Risk Management Plan (RMP) facilities and two CalARP regulated facilities located in or managed by (and hence likely affecting) the District or its sphere of influence. These are summarized in Table L.17. Based on the analysis summarized herein, Hazardous Materials (HazMat) receive a rank of **Medium Significance** for the Nipomo CSD. For more details on this hazard, background information, mapping, and analysis refer to subsection 5.3.16 of the Base Plan.

Figure L.10 Hazardous Materials Facilities in or near the Nipomo CSD



Source: CalOES, EPA, San Luis Obispo County Planning & Building, LAFCO, Wood Plc

**Table L.17 Summary of Hazardous Materials Facilities in or near the Nipomo CSD**

Source of Facility Information	Facility	Chemical/s or Substance/s Handled	Website
CalARP	Buttonwillow Warehouse	Paraquat Dichloride	http://techag.com/
	Speedling	Chlorine	https://nip-speedling.business.site/
EPA RMP	California Chemical of Santa Barbara County	Ready-Mix Concrete	http://oaspub.epa.gov/enviro/fac_gateway.main?p_regid=110000528956
	Guadalupe Cooling Company	Crop production chemicals; refrigerated materials	http://oaspub.epa.gov/enviro/fac_gateway.main?p_regid=110000560553

Source: CalOES, EPA, Wood Plc Analysis

Note: CalARP = California Accidental Release Program; EPA RMP = Environmental Protection Agency Risk Management Plan

L.4 Capability Assessment

Capabilities are the programs and policies currently in use to reduce hazard impacts or that could be used to implement hazard mitigation activities. This capability assessment is divided into five sections: regulatory mitigation capabilities, administrative and technical mitigation capabilities, fiscal mitigation capabilities, mitigation outreach and partnerships, and other mitigation efforts.

To develop this capability assessment, the jurisdictional and district planning representatives used a matrix of common mitigation activities to inventory policies or programs in place. The team then supplemented this inventory by reviewing additional existing policies, regulations, plans, and programs to determine if they contributed to reducing hazard-related losses.

During the plan update process, this inventory was reviewed by the jurisdictional and district planning representatives and Wood consultant team staff to update information where applicable and note ways in which these capabilities have improved or expanded. In summarizing current capabilities and identifying gaps, the jurisdictional planning representatives also considered their ability to expand or improve upon existing policies and programs as potential new mitigation strategies. The Nipomo CSD capabilities are summarized below.

L.4.1 Regulatory Mitigation Capabilities

Table L.18 Nipomo CSD Regulatory Mitigation Capabilities identifies existing regulatory capabilities the District has in place to help with future mitigation efforts. Note: many of the regulatory capabilities that can be used for the District are within the County's jurisdiction. Refer to the Base Plan's Section 6 Capability Assessment for specific information related to the County's mitigation capabilities as well as more details on this topic.

Table L.18 Nipomo CSD Regulatory Mitigation Capabilities

Regulatory Tool	Yes/No	Comments
General plan	No	Included in the San Luis Obispo County efforts
Zoning ordinance	No	Included in the San Luis Obispo County efforts
Subdivision ordinance	No	Included in the San Luis Obispo County efforts
Growth management ordinance	No	Included in the San Luis Obispo County efforts
Floodplain ordinance	No	Included in the San Luis Obispo County efforts
Other special purpose ordinance (stormwater, water conservation, wildfire)	No	Included in the San Luis Obispo County efforts



Regulatory Tool	Yes/No	Comments
Building code	No	Included in the San Luis Obispo County efforts
Fire department ISO rating	No	Included in the San Luis Obispo County efforts
Erosion or sediment control program	No	Included in the San Luis Obispo County efforts
Stormwater management program	No	Included in the San Luis Obispo County efforts
Site plan review requirements	No	Included in the San Luis Obispo County efforts
Capital improvements plan	Yes	NCSD Budget Document
Economic development plan	No	Included in the San Luis Obispo County efforts
Local emergency operations plan	Yes	NCSD Emergency Operations Plan
Other special plans	No	Included in the San Luis Obispo County efforts
Flood Insurance Study or other engineering study for streams	No	Unknown
Elevation certificates (for floodplain development)	No	Included in the San Luis Obispo County efforts

Source: Wood Data Collection Guide, 2019; Nipomo CSD

L.4.2 Administrative/Technical Mitigation Capabilities

Table L.19 Nipomo CSD Administrative/Technical Mitigation Capabilities identifies the personnel responsible for activities related to mitigation and loss prevention in the Nipomo Community Services District.

Table L.19 Nipomo CSD Administrative/Technical Mitigation Capabilities

Personnel Resources	Yes/No	Department/Position/Comments
Planner/engineer with knowledge of land development/land management practices	No	SLO County Planning
Engineer/professional trained in construction practices related to buildings and/or infrastructure	Yes	Engineering/Operations. Director is Peter Sevcik
Planner/engineer/scientist with an understanding of natural hazards	No	
Personnel skilled in GIS	Yes	Contract Services: MKN Engineering & Associates
Full time building official	No	SLO County Planning
Floodplain manager	No	SLO County Planning
Emergency manager	No	SLO County
Grant writer	No	
Other personnel	No	
GIS Data Resources (Hazard areas, critical facilities, land use, building footprints, etc.)	Yes	District infrastructure
Warning systems/services (Reverse 9-11, outdoor warning signals)	No	

Source: Wood Data Collection Guide, 2019; Nipomo CSD

L.4.3 Fiscal Mitigation Capabilities

Table L.20 identifies financial tools or resources that the CSD could potentially use to help fund mitigation activities.

**Table L.20 Nipomo CSD Fiscal Mitigation Capabilities**

Financial Resources	Accessible/Eligible to Use (Yes/No)
Community Development Block Grants	No
Capital improvements project funding	Yes
Authority to levy taxes for specific purposes	Yes
Fees for water, sewer, gas, or electric services	Yes
Impact fees for new development	No
Incur debt through general obligation bonds	No
Incur debt through special tax bonds	No
Incur debt through private activities	No
Withhold spending in hazard prone areas	No

L.4.4 Mitigation Outreach and Partnerships

The Nipomo Community Services District runs a responsible water use outreach program to encourage conservation and efficiency by sending out public notices via quarterly newsletters, school outreach efforts, and bill stuffers for water conversation, responsible water use, and sewer misuse examples. Other outreach, partnership, and general district efforts include those stated in Nipomo's Strategic Plan, updated in 2018.

L.4.5 Opportunities for Enhancement

Based on this capabilities assessment and the noted information from existing plans and efforts (e.g., those noted in the District's Strategic Plan from 2018), the Nipomo Community Services District has several existing mechanisms in place that help to mitigate hazards. There are also opportunities for the District to expand or improve on these policies and programs to further protect the community. Future improvements may include: providing training for staff members related to hazards or hazard mitigation grant funding in partnership with the County and Cal OES; or even obtaining official certifications such as Storm Ready or FireWise certification. Additional training opportunities will help to inform District staff and board members on how best to integrate hazard information and mitigation projects into the District policies and ongoing duties of the District. Continuing to train District staff on mitigation and the hazards that pose a risk to the Nipomo Community Services District will lead to more informed staff members who can better communicate this information to the public and prevent or respond to changes in development and the District makeup overall. Furthermore, the Planning Team for the District noted that Nipomo often seeks to find opportunities to reinforce and strengthen its infrastructure during the initial design of facilities planned to be built. A review process that involves assessing other existing facilities against hazards to determine their vulnerability has not been fully cataloged, so Nipomo hopes to continue these ongoing efforts in the future.

L.5 Mitigation Strategy

L.5.1 Mitigation Goals and Objectives

The Nipomo CSD adopts those hazard mitigation goals and objectives developed by the County Planning Team and described in Section 7 of the Base Plan: Mitigation Strategy.

L.5.2 Mitigation Actions

The Planning Team for the Nipomo Community Services District identified and prioritized the following mitigation actions based on the conducted risk assessment (see Table L.21). Actions were prioritized using the process described in subsection 7.2.1 of the Base Plan. Background information and information on how each action





will be implemented and administered, such as ideas for implementation, responsible office, potential funding, estimated cost, and timeline are also included. Actions with an asterisk (*) are those that mitigate losses to future development.



**Table L.21 Nipomo CSD's Mitigation Action Plan**

ID	Hazard(s) Mitigated	Description/Background/Benefits	Lead Agency and Partners	Cost Estimate	Potential Funding	Priority	Timeline	Status/ Implementation Notes
N.1	Earthquake	Retrofit treatment facility buildings and process infrastructure to withstand earthquake shaking.	NCSD	Unknown	Rates/ Grants	Medium	2030	Not started/Begin Assessment Process 2020
N.2*	Drought	Add secondary source of water supply as additional supply to hedge against future drought conditions.	NCSD	\$5 Mil.	Rates/ Grants	High	2025	Planned to be completed by 2025
N.3	Wildfire	Install backup generators at key water production facilities to ensure water availability during power grid failures or brownouts and also to ensure that firefighting capacity remains.	NCSD	\$125,000 /site	Rates and Charges/ Grants	High	2021-2024	4 sites to be retrofitted, one per year starting Fiscal Year 2021





L.6 Implementation and Maintenance

Moving forward, the Nipomo Community Services District will use the mitigation action table in the previous section to track progress on implementation of each project. Implementation of the plan overall is discussed in Section 8 of the Base Plan.

Incorporation into Existing Planning Mechanisms

The information contained within this Annex and the Base Plan, including results from the Vulnerability Assessments and the Mitigation Strategy will be used by the District to help inform updates of the Nipomo CSD's existing plans (e.g. Strategic Plan), as well as in the development of additional local plans, programs, regulations, and policies. Understanding the hazards which pose a risk and the specific vulnerabilities to the District and its sphere of influence will help in future capital improvement planning and development for the District. The San Luis Obispo County Planning & Building Department may utilize the hazard information when reviewing a site plan or other type of development applications within or nearby the boundaries of the Nipomo Community Services District area. As noted in Section 8, the Planning Team representative/s from the Nipomo Community Services District will report on efforts to integrate the hazard mitigation plan into local plans, programs, regulations, and policies and will report on these efforts at the annual Hazard Mitigation Plan and Planning Team review meeting.

Monitoring, Evaluation and Updating the Plan

The Nipomo Community Services District will follow the procedures to monitor, review, and update this plan in accordance with San Luis Obispo County as outlined in Section 8 of the Base Plan. The District will continue to involve the public in mitigation, as described in subsection 8.3 of the Base Plan. The CSD General Manager will be responsible for representing the Community Services District in related County Hazard Mitigation Plan meetings or events, and for coordination with County staff and departments during plan updates. The Nipomo CSD realizes it is important to review the plan regularly and update it every five years in accordance with the FEMA Disaster Mitigation Act Requirements as well as other State of California requirements.



ANNEX M

Oceano Community Service District

Local Hazard Mitigation Plan

Local Hazard Mitigation Plan For the Oceano Community Services District



March 2019



Prepared by Category Five Professional Consultants, Inc. 



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Oceano Community Services District Local Hazard Mitigation Plan



I. ADOPTION RESOLUTIONS

A. OCSD BOD Adoption Resolution

OCEANO COMMUNITY SERVICES DISTRICT RESOLUTION NO: 2019 - 04

RESOLUTION ADOPTING A MULTI-JURISDICTIONAL LOCAL HAZARD MITIGATION PLAN

WHEREAS, mounting costs of disaster recovery in the nation over the past decade has promoted interest in providing effective ways to minimize our country's hazard vulnerability; and

WHEREAS, the Disaster Mitigation Act (DMA) of 2000, also commonly known as "The 2000 Stafford Act Amendments," constitutes an effort by the Federal government to reduce the rising cost of disasters; and

WHEREAS, the Disaster Mitigation Act of 2000 (the Act) requires local governments to develop and submit mitigation plans in order to qualify for the Hazard Mitigation Grant Program (HMGP) project funds; and

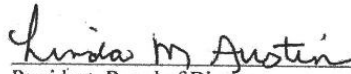
WHEREAS, the purpose of the Disaster Mitigation Act of 2000 was to establish a national program for pre-disaster mitigation, streamline administration of disaster relief at both the federal and state levels, and control federal costs of disaster assistance; and

WHEREAS, the District has concluded a planning process which allowed participation by the local community has developed a Local Hazard Mitigation Plan that meets the needs established by the Act.


NOW, THEREFORE, BE IT RESOLVED that the Oceano Community Services District Board hereby adopts the Local Hazard Mitigation Plan attached hereto as Exhibit A.

PASSED AND ADOPTED by the Board of Directors of the Oceano Community Services District on May 22, 2019 by the following vote:

Director Gibson, Director Villa, Director Replogle
AYES: Vice President White, President White
NOES: None
ABSTAIN: None
ABSENT: None

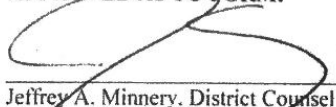

Linda M. Austin
President, Board of Directors
of the Oceano Community Services District

ATTEST:



Board Secretary of the
Oceano Community Services District

APPROVED AS TO FORM:



Jeffrey A. Minnery, District Counsel

Oceano Community Services District Local Hazard Mitigation Plan



B. FEMA Adoption Resolution

U.S. Department of Homeland Security
1111 Broadway, Suite 1200
Oakland, CA. 94607-4052



FEMA

June 3, 2019

Paavo Ogren
General Manager
Oceano Community Services District
1655 Front Street
Oceano, CA 93445

Dear Mr. Ogren:

We have completed our final review of the *Local Hazard Mitigation Plan for the Oceano Community Services District*, officially adopted by the Oceano Community Services District on May 22, 2019 and found the plan to be in conformance with Title 44 Code of Federal Regulations (CFR) Part 201.6 *Local Mitigation Plans*.

The approval of this plan ensures the Oceano Community Services District's continued eligibility for project grants under FEMA's Hazard Mitigation Assistance programs, including the Hazard Mitigation Grant Program, Pre-Disaster Mitigation Program, and Flood Mitigation Assistance Program. All requests for funding, however, will be evaluated individually according to the specific eligibility, and other requirements of the particular program under which applications are submitted.

FEMA's approval of the *Local Hazard Mitigation Plan for the Oceano Community Services District* is for a period of five years, effective starting the date of this letter. Prior to May 22, 2024, Oceano Community Services District is required to review and revise its plan to reflect changes in development, progress in local mitigation efforts, and changes in priorities, and resubmit it for approval in order to continue to be eligible for mitigation project grant funding. The enclosed plan review tool provides additional recommendations to incorporate into the plan when Oceano Community Services District undertakes its identified plan maintenance process.

If you have any questions regarding the planning or review processes, please contact the FEMA Region IX Hazard Mitigation Planning Team at fema-r9-mitigation-planning@fema.dhs.gov.

Sincerely,

fw Juliette Hayes
Director
Mitigation Division
FEMA, Region IX

Enclosure

cc: Adam Sutkus, Hazard Mitigation Planning Chief, California Governor's Office of Emergency Services
Jennifer Hogan, State Hazard Mitigation Officer, California Governor's Office of Emergency Services

www.fema.gov



II. EXECUTIVE SUMMARY

A. General Plan Description

The mounting cost of disaster recovery in our nation during the past decade has engendered a renewed interest in uncovering effective ways to minimize our country's hazard vulnerability. The Oceano Community Services District has joined a nationwide effort to develop a jurisdiction specific hazard mitigation plan. The goal of this local hazard mitigation plan is to arrive at practical, meaningful, attainable and cost-effective mitigation solutions to minimize the District's vulnerability to identified hazards and ultimately reduce both human and financial losses subsequent to a disaster.

After reviewing existing applicable plans, technical reports and historical data, in-depth risk assessments were performed to identify and evaluate each natural and man-made hazard that could impact the study area. The future probability of these identified hazards and their potential impact to the community is described.

Vulnerability assessments were performed which summarized the identified hazards' impact to each community's critical structures, infrastructure and future development. An estimate of the potential dollar losses to vulnerable structures was determined.

The risk and vulnerability assessments in addition to a local capability assessment were used to determine mitigation goals and objectives to minimize long-term vulnerabilities to the identified hazards. These goals and objectives were the foundation behind the development of a comprehensive range of specific attainable mitigation actions created for each jurisdiction.

An Action Plan was developed to assign responsibility and identify funding for each mitigation action. A plan to maintain, review and monitor the plan over time was created to ensure the goals and objectives are achieved and the plan remains a relevant document.

The entire process was shared with the Oceano Community Services District and a wide range of community stakeholders. The Plan was also shared with the general public and approved by the Oceano Community Services District Board of Directors.



Oceano Community Services District Local Hazard Mitigation Plan

B. Plan Purpose and Authority

The Disaster Mitigation Act (DMA) of 2000, also commonly known as “The 2000 Stafford Act Amendments” (the Act), constitutes an effort by the Federal government to reduce the rising cost of disasters. The Act stresses the importance of mitigation planning and disaster preparedness prior to an event.

Mitigation Planning Section 322 of the Act requires local governments to develop and submit mitigation plans in order to qualify for the Hazard Mitigation Grant Program (HMGP) project funds. It also increases the amount of HMGP funds available to states meeting the enhanced planning criteria, and enables these funds to be used for planning activities.

For disasters declared after November 1, 2004, the Oceano Community Services District must have an LHMP approved pursuant to §201.6 in order to receive FEMA Pre-Disaster Mitigation (PDM) project grants or to receive post-disaster Hazard Mitigation Grant Program (HMGP) project funding. This LHMP is written to meet the statutory requirements of DMA 2000 (P.L. 106-390), enacted October 30, 2000 and 44 CFR Part 201 – Mitigation Planning, Interim Final Rule, published February 26, 2002.

To facilitate implementation of the DMA 2000, the Federal Emergency Management Agency (FEMA) created an Interim Final Rule (the Rule), published in the Federal Register in February of 2002 at section 201 of 44 CFR. The Rule spells out the mitigation planning criteria for States and local communities. Specific requirements for local mitigation planning efforts are outlined in section §201.6 of the Rule. Local jurisdictions must demonstrate that proposed mitigation actions are based upon a sound planning process that accounts for the inherent risk and capabilities of the individual communities as stated in section §201.5 of the Rule.

In developing this comprehensive Hazard Mitigation Plan, FEMA’s Multi-Hazard Mitigation Planning Guidance (March 2004 and July 2008) was strictly adhered to for the purpose of ensuring thoroughness, diligence, and compliance with the DMA 2000 planning requirements.



III. PLANNING PROCESS

A. DMA 2000 Requirements

DMA Requirements §201.6(b) and §201.6(c)(1):

An open public involvement process is essential to the development of an effective plan. In order to develop a more comprehensive approach to reducing the effects of natural disasters, the planning process shall include:

- (1) An opportunity for the public to comment on the plan during the drafting stage and prior to plan approval;
- (2) An opportunity for neighboring communities, local and regional agencies involved in hazard mitigation activities, and agencies that have the authority to regulate development, as well as businesses, academia and other private and non-profit interests to be involved in the planning process; and
- (3) Review and incorporation, if appropriate, of existing plans, studies, reports, and technical information.

The plan shall document the planning process used to develop the plan, including how it was prepared, who was involved in the process, and how the public was involved.

B. Plan Development and Public Input Process

At the onset of the planning process, a wide-range of community stakeholders, all neighboring communities, and the County of San Luis Obispo was invited to participate in the drafting stage of the Hazard Mitigation Plan. *Please see Preliminary Notice to Neighboring Communities-Attachment B*

Informative letters were sent out to numerous business owners, community groups, and residents in addition to key representatives from neighboring jurisdictions and the County to encourage their participation. These individuals comprised a Hazard Mitigation Planning Group. Planning group meetings were held to: 1) Explain the benefits of constructing a Hazard Mitigation Plan for the Oceano Community Services District, 2) Describe the planning and approval process, 3) Review local hazards of concern, 4) Listen to particular areas concerning stakeholders, 5) Explain the risks and vulnerability to the District's people, buildings and infrastructure, 6) Propose and discuss mitigation goals, objectives and actions, 7) Explain how mitigation actions are prioritized, 8) Describe how the mitigation actions will be carried out, and 9) Encourage stakeholder feedback and public input. A capability assessment and action plan were developed to ensure mitigation actions were realistic and



attainable and to assign funding sources and responsibility for each proposed activity. These were also reviewed with planning group members.

Once the District and Planning Group Members were satisfied with the newly constructed draft plan and its mitigation goal, objectives and actions, a noticed public forum was held on November 17, 2018. This meeting was widely advertised both locally and in neighboring communities to provide an opportunity for the general public, bordering communities and regional agencies involved in hazard mitigation activities to participate in the planning process. Notice of the public forum was posted at the District office, on the District website and also sent out to Oceano CSD residents in their October 2018 water bills. It was also sent electronically to Oceano Elementary School parents via an app called PeachJar. Additionally, it was posted on the Nextdoor neighborhood website. Further, a postcard mailer announcing the event was sent to all Oceano and Halcyon residents the first week in November. A separate notification letter was sent to the San Luis Obispo County Office of Emergency Services Manager in addition to City Managers from all neighboring communities. (Attachments C and D) Several weeks prior to the public forum, the newly constructed Plan was posted on the District website to enable the public and stakeholders ample time to read and evaluate it. On November 17, the contractors presented the plan highlights and proposed mitigation actions to the general public at the Oceano Community Center located at 1425 19th Street in Oceano. The meeting was well attended. A Power Point presentation provided a detailed explanation of the risks and vulnerabilities the community faced. The mitigation goals, objectives and actions were explained as were the resources that would be used to help mitigate these hazards. Following the presentation, the public was invited to attend a question and answer session where they had the opportunity to provide feedback about the overall Plan and proposed mitigation goals and activities.

The public input was predominantly centered on two issues: 1) the ongoing flooding along Highway 1 and 2) climate warming and the subsequent sea level rise. Most attendees communicated their frustration over these issues while concurrently expressing appreciation that the County and the District appeared to be making progress on the flooding issue.

The public comments also brought to light the fact that over time operations at the neighboring Pismo Beach State Park have resulted in a lowering of the sand dunes in the vicinity of the Pier Avenue beach onramp. This factor coupled with sea level rise creates potential flooding to a portion of the District. The contractors subsequently added new verbiage in a number of areas of the plan to address this issue. For the non-applicable feedback received, the consultants explained why these suggestions were not valid to warrant incorporation into the plan. All comments were reviewed with the stakeholder group and incorporated into the Plan as appropriate.

Oceano Community Services District Local Hazard Mitigation Plan



The Local Hazard Mitigation Planning Group was comprised of the following agency representatives and key stakeholders:

Name	Agency	Title	Attended Planning Group Meetings	Identified Hazards and Assisted with Mitigation Action Development	Additional Role
Paavo Ogren	Oceano Community Services District	General Manager	Yes	Yes	Liaison to OCSD Board and FCFA Board
Ron Alsop	San Luis Obispo County Office of Emergency Services	Emergency Services Manager	Yes	Yes	Planning Advisor
Stuart MacDonald	San Luis Obispo County Sheriff's Office	Commander	Yes	Yes	Law Enforcement Technical Specialist
Steve Lieberman	Five Cities Fire Authority	Fire Chief	No	No	Technical Specialist Fire Service, Liaison FCFA Board
Karen White	Oceano Community Services District	President	Yes	Yes	Halcyon Community Liaison
Vern Dahl	Oceano Advisory Committee	Vice President, Chair	Yes	Yes	Liaison to OAC
Andy Stenson	Lucia Mar Unified School District	Assistant Superintendent of Business Services	Yes	Yes	School District Specialist, Representative to School District Board

Oceano Community Services District Local Hazard Mitigation Plan



Dena Bellman	California State Parks	Planner, Park and Recreation Specialist	Yes	Yes	Liaison to State Parks
Nola Engelskirger	County of San Luis Obispo	Staff Engineer, Utilities Division	Yes	Yes	Technical Specialist-Utilities
Jill Ogren	County of San Luis Obispo	Engineer IV	Yes	Yes	Technical Specialist, Flood Control
Mladen Bandov	County of San Luis Obispo Public Works	Water Resources Engineer	Yes	Yes	Technical Specialist, Water Resources
Megan Martin	SLO County Planning and Building	Supervising Planner	Yes	Yes	Land Use and Development Trends
Michael Conger	SLO County Planning and Building	Planner	Yes	Yes	Land Use and Development Trends
Linda Austin	Oceano Depot Association	OCSD BOD Member	Yes	Yes	Historian
Villa Infanto	Arroyo Grande Hospital	Vice President Patient Care	Yes	Yes	Healthcare Specialist
Raymond Davis	Dignity Health	Director of Plant Operations	Yes	Yes	Health Facilities Specialist
Janna Nichols	5 Cities Homeless Coalition	Executive Director	Yes	Yes	Liaison to Social Services
Cynthia Repogle	Oceano Beach Community Association/ OCSD Board	President/ Director	Yes	Yes	Liaison to OAC

Oceano Community Services District Local Hazard Mitigation Plan



Rebecca Britton	Boys and Girls Club, Oceano	Director of Operations	Yes	Yes	Community Representative
John Taylor	Phelan Taylor Produce Company	Owner	Yes	Yes	Local Business Owner
Lynne Schlenker	Great American Melodrama	Owner	Yes	Yes	Local Business Owner
Robin Harris	South County CERT/ Oceano Resident	Emergency Preparedness Task Force Chair	Yes	Yes	Community Support/ Emergency Response
Nicole Miller	Oceano Community Services District	Account Administrator III	Yes	Yes	Project Supervisor
Dan Sutton	Pismo Oceano Vegetable Exchange	General Manager	Yes	Yes	Local Business Owner
Bob Neumann	Category Five Professional Consultants	Consultant/ Vice-President	Yes	Yes	Technical Specialist- Public Safety
Sheri Eibschutz	Category Five Professional Consultants	Consultant/ President	Yes	Yes	Facilitator/ Planner



C. Incorporation of Existing Plans and Other Information

At the onset of and throughout the hazard mitigation planning process, all applicable local emergency operations plans and geotechnical reports were reviewed and incorporated into this mitigation plan. The following sources were used:

- San Luis Obispo County General Plan including:
 - Land Use Element
 - Open Space Element
 - Safety Element
 - Housing Element
- CAL FIRE/County Fire Management Plan
- California State Hazard Mitigation Plan
- San Luis Obispo County Dam and Levee Failure Plan
- San Luis Obispo County Hazard Mitigation Plan
- San Luis Obispo County Flood Control - Conservation Management Guide
- Local and State land use regulations
- Oceano Storm Water Management Plan
- Oceano Drainage and Flood Control Study (RMC, 2004)
- Past disaster declarations
- Flood Insurance Rate Maps (FIRM's)
- Airport Land Use Plan for the Oceano County Airport
- San Luis Obispo County Office of Emergency Services
 - Flood Plan
 - Tsunami Plan
 - Earthquake Plan
- NASA Global Climate Change Guidance
- National Research Council Sea Level Rise for the Coast of California, Oregon and Washington



Oceano Community Services District Local Hazard Mitigation Plan

D. Plan Adoption

Once planning group members and the general public had an opportunity to review, ask questions and comment on the proposed plan, the newly constructed LHMP was submitted to the State Hazard Mitigation Office at Cal OES. Upon receipt of approval by the State Hazard Mitigation Office, the plan was forwarded to FEMA for approval. FEMA preliminary adoption of the plan occurred on March 29, 2019. The LHMP was then taken to the Oceano Community Services District Board of Directors for approval on May 22, 2019. Adoption by the local governing body demonstrates the jurisdiction's commitment to fulfilling the hazard mitigation goals and actions outlined in the plan. Adoption legitimizes the plan and authorizes responsible agencies to execute their responsibilities. The OCSD Board of Directors approved and adopted the plan on May 22, 2019. FEMA formally adopted the OCSD Local Hazard Mitigation Plan on June 3, 2019.

IV. JURISDICTION PROFILE

A. Area History

Early Spanish explorers observed Indian settlements in the Oceano vicinity with European explorers arriving in 1769. In 1882, the developer, Coffee Adam Rice, purchased a track of land in Oceano, planned the town, and commenced construction on an enormous Victorian mansion which later was transformed into the Halcyon Sanatorium. In 1895, the Southern Pacific Railroad reached the region and a depot was constructed the following year. The Oceano Depot, which brought passenger, freight and telegraph service is believed to have played a vital role in the settlement of this area. A decade later, developers built the Oceano Pavilion on the beach along with a 1,000 foot pier and two boardwalks.

In 1905, the Villa Hotel was built at the end of Juanita Street. Less than a decade later, this hotel was transformed into the only Buddhist Monastery in North America. During World War II, the Oceano Pavilion became headquarters for the U.S. Coast Guard. It later became a roller skating rink before being torn down in 1961. The primary industry in the region was vegetable growing and packing, clamming, and mining. Despite the fact that the depot suspended passenger, mail and telegraph services in the 1950's, vegetable shipping kept the freight office active until changes in agriculture production and packing methods led to the depot's eventual closure in 1973.

The Oceano Community Services District also includes the community of Halcyon which was founded in 1903 by the Theosophical Temple of the People. In early 2017, the community was placed on the Department of Interior's (National Park Service) Historical Registry as an Historical District.



Oceano Train Depot Constructed in 1896



Oceano Hotel and Oceano Saloon (built in 1902)



B. District Overview

The Oceano Community Services District (OCS D) is an independent special district with approximately 7,600 residents and businesses in Oceano and Halcyon. Oceano is a census designated place with 1.5 square miles of land and .02 square miles of water. Halcyon is an unincorporated community of 125 acres just south of the City of Arroyo Grande.

The area to the east and south of the District consists of the Arroyo Grande Creek flood plain. It is also referred to as the Cienaga Valley. The area is prime farmland and is in constant production, engendering a significant agricultural economic impact.

Oceano is known as the ‘Gateway to the Dunes’ as its beach contains the 1,500 acre Oceano Dunes State Vehicular Recreation Area which is overseen by the California Department of Parks and Recreation. The Oceano Dunes attract a wealth of tourists to the area as it is the singular California Park that offers shoreline camping. Guests can drive off-highway vehicles (OHV) on the beach and dunes alongside the Oso Flaco Natural area. It is also a popular destination for fishing, surfing, clamming, and hiking.

C. District Services

The District provides Fire Protection and Emergency Services, Potable Water service, Garbage and Recycling, Wastewater Collection and Street Lighting. The District is also authorized to offer parks and recreation services but is not doing so at this time. The services are described as follows:

Fire Protection and Emergency Services

Fire and emergency services within the OCS D are provided through the Five Cities Fire Authority (FCFA) which was formed in 2010 under a Joint Powers Agreement (JPA) between the cities of Arroyo Grande, Grover Beach and the Oceano Community Services District. The OCS D pays a portion of the annual costs of FCFA services based on a funding formula established in the FCFA - JPA. One of the OCS D Board of Directors represents the District on the FCFA Board.

Operating out of three fire stations, the Department delivers fire suppression, fire prevention, light and heavy rescue, and emergency medical service at the basic life support level. The average response time to the service area is six minutes, answering some 3,500 calls for service each year.

Potable Water

The OCS D delivers potable water service to approximately 2,200 connections. The District’s water supplies include groundwater, Lopez Lake and State water. The latter two are provided by the County of San Luis Obispo under terms of water supply contracts. The District’s water



supply reliability is relatively high and the district was increasing water in storage during the recent drought.

The California State Division of Drinking Water regulates the District's water supplies. Regulation of the District's groundwater supply is also subject to the stipulations adopted in 2005 for the adjudication of the Santa Maria groundwater basin.

Wastewater Collection

The District offers wastewater collection via a network of local pipelines that run into South San Luis Obispo County Sanitation District (SSLOCSD) pipelines which handles wastewater treatment and disposal. The Central Coast Regional Water Quality Control Board regulates the District's wastewater operations.

Cannon Corporation Engineering Consultants is currently assessing deferred water and wastewater infrastructure projects for the jurisdiction.

Garbage and Recycling

The OCSD provides obligatory solid waste and recycling services through a franchise agreement with South County Sanitary Services, Inc. The District works to abate illegal dumping within the community by offering incentives to promote a cleaner community. They offer 'Neighborhood Clean-up's' where they bring in dumpsters and help with trash disposal. They also offer a trash incentive of up to \$50 to offset the cost of removing large unwanted items.

D. Government

OCSD Governing Board

OCSD is an independent special district governed by a five-member board who are elected by voters residing in Oceano and Halcyon.

OCSD Board meetings are conducted on the second and fourth Wednesdays of the month at 6 pm at the OCSD office at 1655 Front Street in Oceano. Meetings are open to the public.

State and Federal Government

In the State legislature, Oceano is in the 17th Senate District and in the 35th Assembly District. In the United States House of Representatives, Oceano is in California's 24th congressional district.



E. Demographics

Population Ethnicity

According to the 2010 US Census report, the population density indicated 4,710.2 individuals per square mile. Oceano's 2010 ethnic makeup was comprised of:

- 5,105 White-70.1%
- 3,484 Hispanic or Latino of any race-47.8%
- 120 Native American-1.6%
- 165 Asian-2.3%
- 62 African American-0.9%
- 7 Pacific Islander-0.1%
- 1,509 other races-20.7%
- 318 from 2 or more races-4.4%

Population Age

The median age of Oceano residents was 35.4 years old in 2010, with diverse aging groups residing within the community:

- Median 1,738 (23.9%) individuals under the age of 18
- 747 (10.3%) people aged 18 to 24
- 2,028 (27.8%) residents aged 25 to 44
- 1,870 (25.7%) individuals aged 45 to 64
- 903 (12.4%) people were 65 years of age or older
- Female to male ratio: 100: 101.9



Households

Oceano had 2,603 households in 2010 with an average household size of 2.80. These households were comprised of:

- 904 (34.7%) had minor children residing in them
- 1,147 (44.1%) contained opposite-sex married couples living together
- 360 (13.8%) contained a single female household
- 197 (7.6%) had a single male household
- 97 (7.6%) unmarried opposite-sex partnerships
- 38 (1.5%) same-sex married couples or partnerships
- 680 households (26.1%) were made up of individuals
- 266 (10.2%) had someone living alone who was 65 years of age or older
- There were 1,704 families (65.5% of all households) with an average family size of 3.39.

F. Housing Profile

Oceano's median home value is \$401,400. Over the last 10 years, home appreciation is 13.58%. The median age of real estate within this census designated place is 36 years.

Renters comprise 38.81% of the population.

100% of the population resides in households and 0% living in institutional or group quarters. In 2010, there were 3,117 housing units at an average density of 2,015.1 per square mile.

Oceano Community Services District Local Hazard Mitigation Plan



HOUSING	Oceano, California	United States
Median Home Age	36	37
Median Home Cost	\$401,400	\$185,800
Home Appr. Last 12 months	8.97%	3.74%
Home Appr. Last 5 yrs.	35.53%	16.02%
Home Appr. Last 10 yrs.	13.58%	-0.68%
Property Tax Rate	\$7.34	\$11.80
Homes Owned	42.08%	56.34%
Housing Vacant	19.11%	12.45%
Homes Rented	38.81%	31.21%

AVERAGE RENT FOR HOME OR APARTMENT	Oceano	U.S.
Studio Apartment	\$750	\$712
1 Bedroom Home or Apartment	\$850	\$825
2 Bedroom Home or Apartment	\$1,100	\$1,027
3 Bedroom Home or Apartment	\$1,600	\$1,379
4 Bedroom Home or Apartment	\$1,920	\$1,601

Source: <https://www.bestplaces.net/housing/city/california/oceano>

Oceano Community Services District Local Hazard Mitigation Plan



VALUE OF OWNER-OCCUPIED HOUSING	Oceano	U.S.
Less Than \$20,000	6.30%	4.57%
\$20,000 to \$39,999	0.82%	3.37%
\$40,000 to \$59,999	4.15%	4.19%
\$60,000 to \$79,999	2.96%	5.74%
\$80,000 to \$99,999	9.41%	6.79%
\$100,000 to \$149,999	8.96%	15.19%
\$150,000 to \$199,999	12.74%	14.69%
\$200,000 to \$299,999	22.15%	18.15%
\$300,000 to \$399,999	11.19%	10.43%
\$400,000 to \$499,999	5.11%	5.70%
\$500,000 to \$749,999	8.96%	6.39%
\$750,000 to \$999,999	4.30%	2.41%
\$1,000,000 or more	2.96%	2.39%

Source: <https://www.bestplaces.net/housing/city/california/oceano>



G. Economy

Job Growth, Income and Occupation

ECONOMY	Oceano	U.S.
Unemployment Rate	4.50%	5.20%
Recent Job Growth	2.58%	1.59%
Future Job Growth	40.66%	37.98%
Sales Taxes	7.50%	6.00%
Income Taxes	8.00%	4.60%
Income per Capita	\$20,725	\$28,555
Household Income	\$48,629	\$53,482
Family Median Income	\$46,545	\$65,443

Source: <https://www.bestplaces.net/economy/city/california/oceano>

POPULATION BY OCCUPATION	Oceano	U.S.
Agriculture, forestry, fishing, hunting	7.75%	1.35%
Mining, quarrying, oil and gas extraction	0.00%	0.61%
Construction	6.87%	6.19%
Manufacturing	5.42%	10.41%
Wholesale trade	2.97%	2.72%
Retail trade	14.68%	11.55%
Transportation and warehousing	2.97%	4.11%
Utilities	0	0

Oceano Community Services District Local Hazard Mitigation Plan



Information	0.48%	2.12%
Finance and insurance	2.18%	4.69%
Real estate, rental, leasing	0.55%	1.89%
Professional, scientific, technical services	3.09%	6.68%
Management of companies	0.00%	0.08%
Administrative, support, waste management services	6.17%	4.27%
Educational services	7.69%	9.34%
Health care and social assistance	9.65%	13.81%
Arts, entertainment, recreation	1.30%	2.16%
Accommodation, food services	18.19%	7.44%
Other services	4.12%	4.94%
Public administration	5.27%	4.80%

Source: <https://www.bestplaces.net/health/city/california/oceano>

H. Land Use

Existing land use within the Oceano Community Service's District is a mosaic of varying types of uses, ownership, character, and intensity. Uses include:

- Both low and medium density residential
- Agriculture
- Parks and recreation
- General commercial
- Public



I. Climate

Sperling's comfort index for Oceano, California is an 84 out of 100, where a higher score indicates a more comfortable year-around climate. The U.S. average for the comfort index is 54. This index is based on the total number of days annually within the comfort range of 70-80 degrees, with a penalty applied for any days with excessive humidity. Oceano receives an annual average of 18 inches of rain compared to a U.S. average of 39 inches. There is an average of 34 days per year with measurable precipitation. Snowfall very rarely occurs. Oceano has approximately 185 sunny days each year with a July average high of 70 degrees and a January average low of 43 degrees.

J. Health Index

Oceano has 2.5 physicians per 1,000 population compared to a U.S. average of 2.1 physicians per 1,000 population.

The Oceano air quality is currently ranked 82 on a scale to 100 (higher is better). This is based on new measures of hazardous air pollutants from the EPA, called the National Air Toxics Assessment. Whereas the old analysis was based solely on results from air monitoring stations, this new method is more comprehensive as it models respiratory illness and cancer risk down to the zip code level.

Water quality in Oceano is currently ranked 30 on a scale to 100 (higher is better). It is important to note that this is a measure of Watershed quality, not the water that comes from the faucet. However, the EPA has stated that a healthy watershed is closely related to drinking water quality. The EPA has a complex method of measuring watershed quality using 15 indicators such as pH, chemicals, metals, and bacteria.

Source: <https://www.bestplaces.net/health/city/california/oceano>

K. Schools

There are two schools located within the Oceano Community Services District boundaries under the administration of the Lucia Mar Unified School District. They are:



Oceano Elementary (TK-6)

1551 17th Street
Oceano, CA 93445

Oceano Elementary has an average of 420 students including Transitional Kindergarten, Kindergarten, and first through sixth grades. 80% of the students are Hispanic, 15% are white. 87% of the students are deemed low-income and the school performs below the State average academically.

Adult Education

1425 19th Street
Oceano, CA 93445

The Adult Education School offers English literacy, High School Diploma or GED, and parent participation programs in addition to a variety of community classes.

L. Transportation

The average one-way home to work commute in Oceano, California, takes 28 minutes. 78% of commuters drive their own car alone, 11% carpool, 3% use mass transit, and 5% work from home.

Highways

San Luis Obispo County contains major transportation arteries including U.S. Highway 101, California State Highways 1, 41, 46, 58, and 166. U.S. Highway 101 and Coast Highway 1 run North to South adjacent to and through the community of Oceano.

Rail

There are two Amtrak stations within 30 miles of the Oceano community center.

Bus/Shuttle

San Luis Obispo Regional Transit Authority

SLO RTA offers intercity fixed route public bus transportation in addition to ADA paratransit service throughout San Luis Obispo County.



South County Transit

South County Transit provides public bus transportation service to the southern portion of San Luis Obispo County including Arroyo Grande, Grover Beach, Pismo Beach, and the unincorporated areas of Oceano.

Rideshare

There are specialized transportation services throughout SLO County including senior and airport shuttles, Runabout ADA service and dial-a-ride.

Airports

There are 2 airports within 30 miles of the Oceano community center:

San Luis Obispo County Regional Airport

Most OCSD residents make use of the new San Luis Obispo County Regional Airport, McChesney Field located just south of the City of San Luis Obispo at 975 Airport Drive. Three commercial airlines: American, United, and Alaska operate out of this airport which now offers flights to Los Angeles, San Francisco, Phoenix, Seattle and Denver. This airport is also home to full-service general aviation facility.

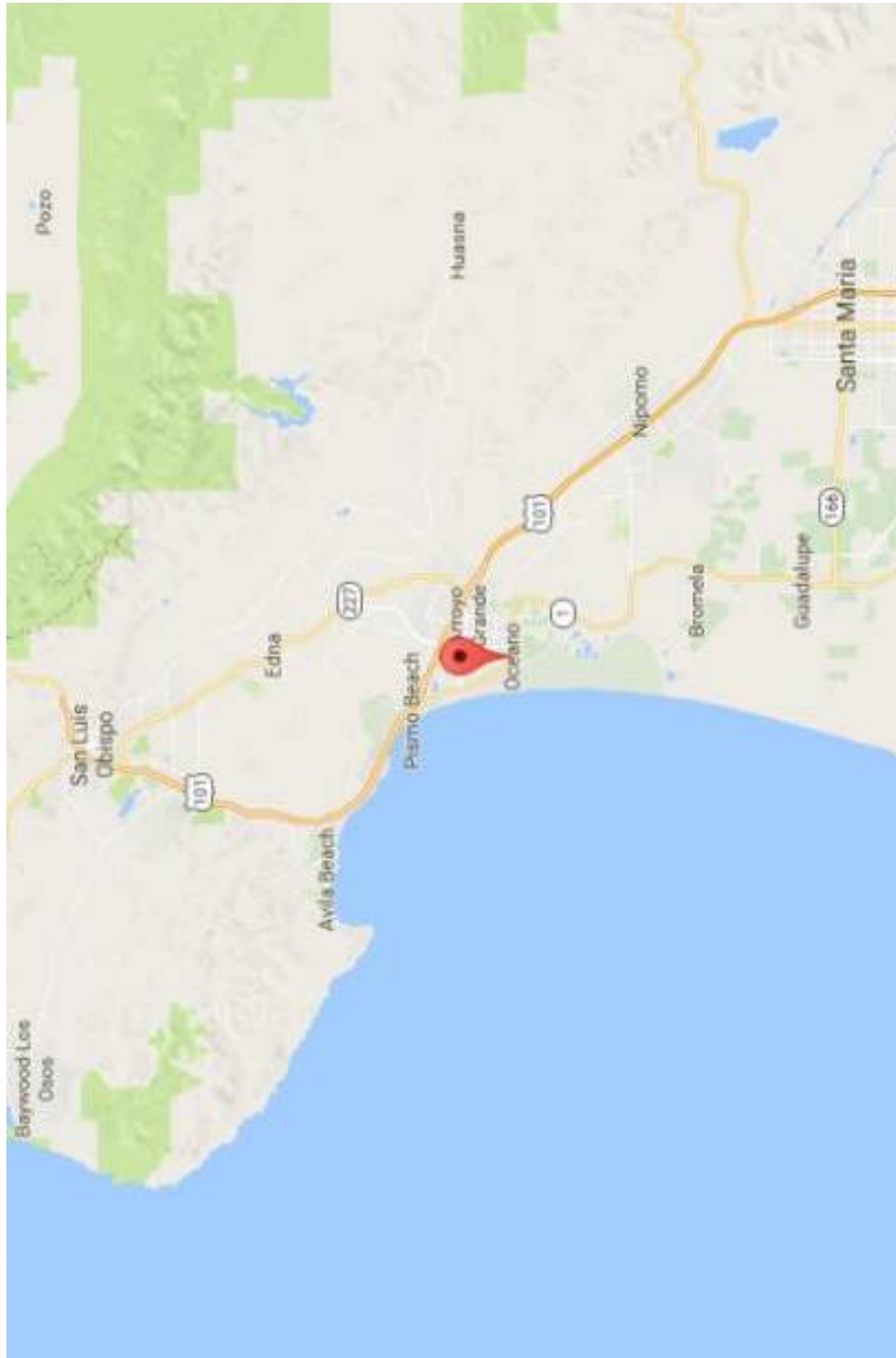
Oceano County Airport

Oceano County Airport is a public airport located one mile west of Oceano's central business district. The airport, which is primarily used for general aviation, only offers non-commercial flights. The airport is on 58 acres with a single runway and no control tower.



Aerial photo of Oceano County Airport

The following maps provide a perspective of the size and layout of the District:



Location of Oceano Community Services District

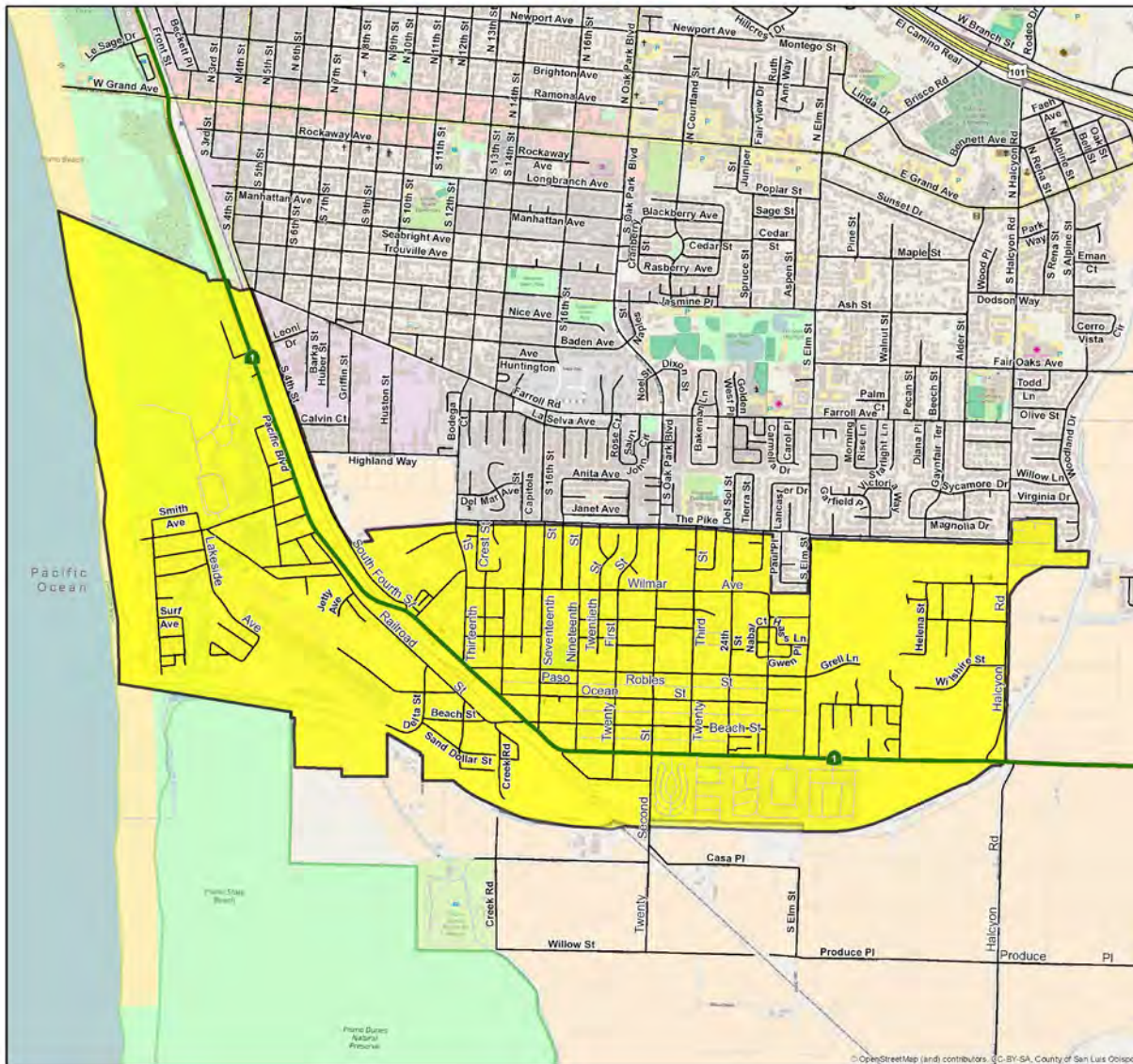


Oceano Community Services District Boundaries Aerial View

Oceano Community Services District Local Hazard Mitigation Plan



Oceano Community Services District Service Area & Sphere of Influence Adopted November 2012



Prepared By SLOLAFCO
Name: Oceano_SOI Bndy
Date: 2/10/2016





V. RISK ASSESSMENT

A. DMA 2000 Requirements

DMA Requirement §201.6(c)(2)(i):	The risk assessment shall include a description of the type of all natural hazards that can affect the jurisdiction.
DMA Requirement §201.6(c)(2)(i):	The risk assessment shall include a description of the location and extent of all natural hazards that can affect the jurisdiction. The plan shall include information on previous occurrences of hazard events and on the probability of future hazard events.
DMA Requirement §201.6(c)(2)(iii):	For multi-jurisdictional plans, the risk assessment must assess each jurisdiction's risks where they vary from the risks facing the entire planning area.

B. Hazard Identification

The following natural hazards can impact this jurisdiction:

- **Earthquake:**
 - Faulting
 - Liquefaction
- **Extreme Weather:**
 - Extreme Heat
 - Freeze
 - Hail Storms
 - Snowfall
 - Thunderstorms
- Windstorms
- Coastal Erosion
- **Drought**
- **Tsunami**
- **Flood**
- Dam Failure
- Levee Failure

Note: While common throughout most of California, a wildland fire threat does not exist in this community. The weather, topography, and the lack of vegetation all combine to eliminate the wildland fire threat.



In predicting the probability and severity of each hazard, the following guidelines have been utilized:

PROBABILITY

LOW: There has been no past history or very minimal record of the hazard event impacting the study area over the past 40-100 years. However, the possibility of this hazard occurring, while limited, does exist.

MEDIUM: This hazard has impacted the study areas in the past over the last 5-40 years, however the occurrence and impact has been limited. This hazard event may occur again in the future.

HIGH: Given the study areas past history of this hazard event impacting the area in the last 1-4 years on a reoccurring basis, it is likely that this event will occur again.

SEVERITY

LOW: The damage is expected to be minimal. There is no expected loss of life and limited injuries to the general public. On-duty first responders or public works crews should be able to manage the event and deal with the impacts. Financial losses will be limited.

MEDIUM: The damage should be limited and confined to the community or neighboring jurisdictions. There may be life loss and injuries. County Mutual Aid resources should be able to manage the event or deal with the impacts. Financial losses could be significant.

HIGH: The damage could be widespread and severe. Multiple deaths and casualties may occur. Out of County Mutual Aid resources will most likely be required to manage the event or deal with the impacts. Financial losses are expected to be significant.

C. Climate Change-Global Warming

Global warming occurs when carbon dioxide (CO₂) and other air pollutants and greenhouse gases collect in the atmosphere and absorb sunlight and solar radiation that have bounced off the earth's surface. Normally, this radiation would escape into space, but these pollutants, which can last for years to centuries in the atmosphere, trap the heat and cause the planet to get hotter. That's what is known as the greenhouse effect.



Oceano Community Services District Local Hazard Mitigation Plan

Data gathered by NASA and NOAA indicate that the planet's average surface temperature has risen about 2.0 degrees Fahrenheit (1.1 degrees Celsius) since the late 19th century, a change driven largely by increased carbon dioxide and other human-made emissions into the atmosphere. Most of the warming happened in the past 35 years, with 16 of the 17 warmest years on record occurring since 2001. 2016, was found to be the warmest year in our planet's history.

Most of the warming in recent decades is very likely the result of human activities. In the United States, the burning of fossil fuels to make electricity is the largest source of heat-trapping pollution, producing about two billion tons of CO₂ every year. Coal-burning power plants are by far the biggest polluters. The country's second-largest source of carbon pollution is the transportation sector, which generates about 1.7 billion tons of CO₂ emissions a year.

Scientists agree that the earth's rising temperatures are fueling longer and hotter heat waves, more frequent droughts, heavier rainfall, and more powerful hurricanes. In 2015, for example, scientists said that the ongoing drought in California, the state's worst water shortage in 1,200 years, was intensified by 15 to 20 percent by global warming. Further, the odds of similar droughts happening in the future have roughly doubled over the past century. In 2016, the National Academies of Science, Engineering, and Medicine announced that it's now possible to confidently attribute certain weather events, like some heatwaves, directly to climate change.

Source: NASA – Global Climate Change

The earth's ocean temperatures are getting warmer, which means that tropical storms can pick up more energy. It is possible that global warming could turn a category 3 storm into a more dangerous category 4 storm. In fact, scientists have found that the frequency of North Atlantic hurricanes has increased since the early 1980s, as well as the number of storms that reach categories 4 and 5. In 2005, Hurricane Katrina, the costliest hurricane in U.S. history, struck the city of New Orleans. The second costliest was Hurricane Sandy which pummeled the East Coast in 2012.

Source: NASA – Global Climate Change 2018

Each year, scientists learn more about the consequences of global warming, and many agree that environmental, economic, and health consequences are likely to occur if current trends continue. These impacts include:

- Melting glaciers, early snowmelt, and severe droughts will cause more dramatic water shortages and increase the risk of wildfires in the American West.



- Forests, farms, and cities will face troublesome new pests, heat waves, heavy downpours, and increased flooding. All these factors will damage or destroy agriculture and fisheries.
- Disruption of habitats such as coral reefs and Alpine meadows could drive many plant and animal species to extinction.
- Allergies, asthma, and infectious disease outbreaks will become more common due to increased growth of pollen-producing ragweed, higher levels of air pollution, and the spread of conditions favorable to pathogens and mosquitoes.

The impacts of global warming are being felt across the globe. Extreme heat waves have caused tens of thousands of deaths around the world in recent years. And in an alarming sign of events to come, Antarctica has been losing about 134 billion metric tons of ice per year since 2002. This rate could speed up if the population continues burning fossil fuels at the current pace, some experts claim, causing sea levels to rise several meters over the next 50 to 150 years.

Sea Level Rise Projections for California

Tide gauges and satellite observations show that in the past century, mean sea level in California has risen 8 inches (20 cm), keeping pace with the global rise. In the past 15 years however, mean sea level in California has remained relatively constant, and may have been suppressed due to factors such as offshore winds and other oceanographic complexities. Bromirski et al. postulate that persistent alongshore winds have caused an extended period of offshore upwelling that has both drawn coastal waters offshore and replaced warm surface waters with cooler deep ocean water. Both of these factors could offset the global sea level rise trend in this region. However, localized sea level suppression will not continue indefinitely. As the Pacific Decadal Oscillation, wind, and other conditions shift, California sea level will continue rising, likely at an accelerated rate. Sea level is projected to increase by 17 to 66 inches (42 to 167 cm) along much of the California coast by the year 2100.

Source: NRC 2012; Bromirski et al. 2011, 2012

Source: 2012 National Research Council Sea-Level Rise for the Coasts of California, Oregon, and Washington: Past, Present, and Future report



Sea Level Rise Projections for California (NRC, 2012)

TIME PERIOD*	NORTH OF CAPE MENDOCINO	SOUTH OF CAPE MENDOCINO
By 2030	-2 – 9 in (-4 – +23 cm)	2 – 12 in (4 – 30 cm)
By 2050	-1 – 19 in (-3 – + 48 cm)	5 – 24 in (12 – 61 cm)
By 2100	4 – 56 in (10 – 143 cm)	17 – 66 in (42 – 167 cm)

*with Year 2000 as a baseline

Source: California Coastal Commission Sea Level Rise Policy Guidance, Aug. 12, 2015

Impacts from sea level rise to the coastal zone include the following:

- Low lying coastal areas may experience more frequent flooding (temporary wetting) or inundation (permanent wetting), and the inland extents of 100-year floods may increase (i.e.-the Pier Avenue ramp located just outside the District boundary).
- Riverine and coastal waters come together at river mouths, coastal lagoons, and estuaries and higher water levels at the coast may cause water to back up and increase upstream flooding (i.e.-Arroyo Grande Creek at the Pacific Oceano).
- Drainage systems that discharge close to sea level could have similar problems, and inland areas may become flooded if outfall pipes back up with salt water.
- Sea level could cause saltwater to enter into groundwater resources or aquifers.

Climate Change-Global warming will undoubtedly have an impact on the naturally occurring hazards in the Oceano Community Services District. Anticipated effects include changes in the range and distribution of plants and animals (pests), and rainfall patterns/intensities (droughts and floods). Public Health impacts can also be expected. Extreme periods of heat and cold, storms, and smoke from fire will have impacts on climate-sensitive diseases and respiratory illnesses. More specific information on impacts can be found in the Drought, Flood, and Tsunami Hazard Profiles of this Plan.



D. Hazard Profiles

➤HAZARD: EARTHQUAKE

Severity: High	Probability: High
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Hazard Definition

An earthquake is a sudden, rapid shaking of the ground caused by the breaking and shifting of rock beneath the earth's surface or along fault lines. For hundreds of millions of years, the forces of plate tectonics have shaped the earth as the huge plates that form the earth's surface move slowly over, under, and past each other. Sometimes the movement is gradual. At other times, the plates are locked together, unable to release the accumulating energy. When the amassed energy grows strong enough, the plates break free causing the ground to shake. Most earthquakes occur at the boundaries where the plates meet, commonly called faults. However, some earthquakes occur in the middle of plates.

Fault

A fault is a fracture in the earth's crust along which movement has occurred either suddenly during earthquakes or slowly during fault creep. Cumulative displacement may be tens or even hundreds of miles if movement occurs over geologic time. However, individual episodes are generally small, usually less than several feet, and are commonly separated by tens, hundreds, or thousands of years. Damage associated with fault-related ground rupture is normally confined to a fairly narrow band along the trend of the fault. Structures are often not able to withstand fault rupture and utilities crossing faults are at risk of damage. Fault displacement involves forces so great that it is generally not feasible (structurally or economically) to design and build structures to accommodate this rapid displacement. Fault displacement can also occur in the form of barely perceptible movement called "fault creep." Damage by fault creep is usually expressed by the rupture or bending of buildings, fences, railroads, streets, pipelines, curbs, and other linear features.

The California Geological Survey (CGS) is charged with recording and mapping faults throughout California. The Alquist-Priolo Earthquake Fault Zoning (AP) Act was passed into law following the destructive February 9, 1971 magnitude 6.6 San Fernando earthquake. The AP Act provides a mechanism for reducing losses from surface fault rupture on a statewide basis. The intent of the AP Act is to insure public safety by prohibiting the placement of most structures for human occupancy across traces of active faults that constitute a potential hazard to structures from surface faulting or fault creep. Fault zoning is continually updated and reviewed by CGS and it is likely that other faults in addition to those currently listed by CGS will be added to the list in the future.



The primary active faults within the County identified by the AP Act include the San Andreas, San Simeon-Hosgri, and Los Osos faults. Two recent studies performed by CGS have estimated the maximum credible ground acceleration that could be generated by active and potentially active faults. Deterministic peak horizontal ground accelerations from these studies range from a low of 0.4 g in the central portion of the County to a high of about 0.7 g along the San Andreas, Rinconada, Oceanic-West Huasna, and coastal fault zones.

The only known mapped fault in the vicinity of Oceano is the Oceano fault. The buried trace of the potentially active Oceano fault is interpreted to strike northwest along the southwestern side of the Cienaga Valley about 1,000 meters southwest of Oceano, and goes offshore near the mouth of Arroyo Grande Creek. Although the fault is classified as potentially active by CGS, review of the Oceano fault suggests that the fault is inactive. The Oceano fault presents a very low fault rupture hazard to Oceano. Although the Oceano fault is likely inactive, it is undesirable to site structures over any fault as a result of non-uniform foundation support conditions and the potential for co-seismic movement that could result from earthquakes on other nearby faults.

Other mapped faults within the South County area include the potentially active Wilmar Avenue fault and the inactive Pismo fault. The Wilmar Avenue fault is exposed in the sea cliff near Pismo Beach and the buried trace of the fault is inferred to strike northwest - southeast parallel and adjacent to U.S. Highway 101 beneath portions of Arroyo Grande.

In 2008, the Shoreline Fault was discovered off the coast in the area of the Diablo Canyon Power Plant which is owned and operated by Pacific Gas and Electric Company (PG&E). The initial study of the fault, using conservative assumptions about the total length of the fault zone, indicates that a potential magnitude 6.5 strike-slip earthquake is possible. Follow up investigations were performed by PG&E in 2009 and 2010 and more detailed studies are planned in order to refine the size and potential of the fault.

Source: Report on the Analysis of the Shoreline Fault Zone, Central Coastal California, Report to the U.S. Nuclear Regulatory Commission, January 2011, PG&E

Historically active faults are generally thought to present the greatest risk for future movement and, therefore, have the greatest potential to result in earthquakes. Active and potentially active faults in San Luis Obispo County are shown on the map found at the end of this section.

Liquefaction

Liquefaction occurs when ground shaking causes the mechanical properties of some fine grained, saturated soils to liquefy and act as a fluid. It is the result of a sudden loss of soil strength due to a rapid increase in soil pore water pressures caused by ground shaking. In order for liquefaction to occur, three general geotechnical characteristics must exist:

1) ground water should be present within the potentially liquefiable zone, 2) the potentially liquefiable zone should be granular and meet a specific range in grain-size distribution, and



3) the potentially liquefiable zone should be of low relative density. If those factors are present and strong ground motion occurs, then those soils could liquefy depending upon the intensity and duration of the strong ground motion. Liquefaction that produces surface effects generally occurs in the upper 40 to 50 feet of the soil column, although the phenomenon can occur deeper than 100 feet. The duration of ground shaking is also an important factor in causing liquefaction to occur. The larger the earthquake magnitude, and the longer the duration of strong ground shaking, the greater the potential there is for liquefaction to occur.

The areas of San Luis Obispo County most susceptible to the effects of liquefaction are those areas underlain by young, poorly consolidated, saturated granular alluvial sediments. These soil conditions are most frequently found in areas that have been inundated with river and flood plain deposits. These conditions do exist in the low lying areas near the Oceano Lagoon and Airport.



Damage to a home in Oceano caused by liquefaction resulting from the 2003 San Simeon Earthquake.

Maps which delineate the areas of San Luis Obispo County and Oceano that are susceptible to liquefaction can be found at the end of this section.



History

Where earthquakes have struck before, they will strike again. The Central California Coast has a history of damaging earthquakes, primarily associated with the San Andreas Fault. However, there have been a number of magnitude 5.0 to 6.5 earthquakes on other faults which have affected large portions of the Central Coast. Recent events include the December 2003 - 6.5 magnitude San Simeon Earthquake and the September 2004 - 6.0 magnitude Parkfield Earthquake.

The following are historic earthquakes that had an effect on San Luis Obispo County:

1830 San Luis Obispo Earthquake

The 1830 earthquake is noted in the annual report from the Mission, and had an estimated magnitude of 5. The location of the event is poorly constrained and cannot be attributed to a specific fault source, but the earthquake reportedly occurred somewhere near San Luis Obispo.

1857 Fort Tejon Earthquake

The approximate 7.9 Fort Tejon earthquake of 1857 was one of the greatest earthquakes ever recorded in the United States. It left a surface rupture scar over 350 kilometers (210 miles) in length along the San Andreas Fault and a maximum surface offset of about 9 meters (30 feet). Yet, despite the immense scale of this quake, only two people were reported killed by the effects of the shock. The exact location of the epicenter is not known. The event is referred to as the Fort Tejon earthquake, because that was the location of the greatest damage. There is evidence to suggest that the epicenter may have been in the Cholame and Parkfield area, which is located in and near the northeastern portions of San Luis Obispo County as a number of foreshocks, 1 to 9 hours before the main event, were report in this area.

Source: <http://www.data.scec.org/significant/forttejon1857.html>

The fact that only two lives were lost was primarily due to the nature of the quake's setting. California in 1857 was sparsely populated, especially in the regions of strongest shaking, and this fact, along with good fortune, kept the loss of life to a minimum. The effects of the quake were quite dramatic, even frightening. Were the Fort Tejon shock to happen today, the damage would easily run into billions of dollars, and the loss of life would likely be substantial, as the present day communities of Wrightwood, Palmdale, Frazier Park, and Taft (among others) all lie upon or near the 1857 rupture area.

1906 San Francisco Earthquake

This earthquake has been studied in detail and the effects in San Luis Obispo County have been documented. Modified Mercalli intensity ratings ranged from III-IV in the inland and north coast portions of the County, and IV-V in the south coast areas. The higher intensities



were felt in areas underlain by alluvial soil, while the lower intensities occurred in areas underlain by bedrock formations.

1916 Avila Beach Earthquake

This magnitude 5.1 event occurred offshore of Avila Beach in San Luis Bay. The earthquake reportedly resulted in tumbling smokestacks of the Union Oil Refinery at Port San Luis, and a landslide that blocked the Pacific Coast railroad tracks. The maximum intensity appears to be approximately VI, but the available descriptions of the shaking are somewhat limited.

1952 Arvin-Tehachapi Earthquake

This 7.7 magnitude earthquake occurred on the White Wolf fault, located south and west of Bakersfield. Throughout most of the San Luis Obispo County, ground shaking intensities of VI were felt. Intensities of IV-V were experienced in the northwest portion of the County, and magnitude VIII intensities were felt in the Cuyama area, in the southeast portion of the County. The higher intensities were likely due to closer proximity to the earthquake epicenter.

1952 Bryson Earthquake

This magnitude 6.2 earthquake likely occurred on the Nacimiento fault, and resulted in intensity ratings of VI throughout most of the western portion of the County. Intensities of IV-V were experienced in the eastern portion of the County. Higher intensities were generally felt in the coastal valley areas that are underlain by alluvial soils.

2003 San Simeon Earthquake

The San Simeon Earthquake struck at 11:15 a.m. on December 22, 2003. The magnitude 6.5 earthquake is attributed to having occurred near the San Simeon/Oceanic/Hosgri Fault system. The epicenter was approximately six miles from the community of San Simeon. As a result of the quake Cambria experienced a residential structure fire, and several commercial and residential buildings were damaged. Some roadways were obstructed and debris blocked some streets. This earthquake resulted in 2 deaths in the City of Paso Robles and water/wastewater infrastructure in the community of Oceano suffered a three million dollar loss.

1934, 1966 and 2004 Parkfield Earthquakes

These earthquakes were all three in the range of magnitude 6.0 and occurred on the San Andreas Fault in or near the northeast corner of the County. Earthquake intensities generally conformed to anticipated characteristics for events of this size, with intense shaking (VII-VIII) being limited to a relatively small area near the epicenters of the quakes. Moderate shaking was experienced in most of the central and western parts of the County. A variation from the expected intensity characteristics was experienced in the La Panza area during the



1934 earthquake. La Panza is approximately 40 miles south of the fault rupture area, but experienced earthquake intensities of VII.

Other Earthquakes

Earthquakes which have occurred outside yet were felt within the County during the last century include events such as the 7.0 Lompoc earthquake in 1927, and the 7.7 Arvin Tehachapi earthquake of 1952. Other more recent earthquakes, such as the 1983 - 6.7 Coalinga earthquake, 1989 - 7.1 Loma Prieta earthquake, 1992 - 7.5 Landers earthquake and the 1994 - 6.6 Northridge earthquake were felt in San Luis Obispo County, however, there was no damage to structures.

Hazard Potential

The Hazard Potential for earthquakes is dependent upon a multitude of factors. A brief description of those factors is presented below:

- **Earthquake Magnitude**

Earthquake magnitude, as generally measured by either the Richter or Moment Magnitude scale, is a measurement of energy released by the movement of a fault. As the amount of energy released by an earthquake increases, the potential for ground shaking impacts also increases.

- **Distance from Epicenter**

Earthquake energy generally dissipates (or attenuates) with distance from a fault. Over long distances, this loss of energy can be significant, resulting in a significant decrease in ground shaking with increased distance from the epicenter.

- **Duration of Strong Shaking**

The duration of the strong ground shaking constitutes a major role in determining the amount of structural damage and the potential for ground failure that can result from an earthquake. Larger magnitude earthquakes have longer durations than smaller earthquakes.

- **Effects of Ground Shaking**

The primary effect of ground shaking is the damage or destruction of buildings, infrastructure, and possible injury or loss of life. Building damage can range from minor cracking of plaster to total collapse. Disruption of infrastructure facilities can



include damage to utilities, pipelines, roads, and bridges. Ruptured gas and water lines can result in fire and scour/inundation damage, respectively, to structures. Secondary effects can include geologic impacts such as co-seismic fault movement along nearby faults, seismically induced slope instability, liquefaction, lateral spreading, and other forms of ground failure and seismic response.

- **Local Geologic Conditions**

The geologic and soil conditions at a particular site have the potential to substantially increase the effects of ground shaking. The thickness, density, and consistency of the soil, as well as shallow ground water levels, have the potential to amplify the effects of ground shaking depending on the characteristics of the earthquake. In general, the presence of unconsolidated soils above the bedrock surface can amplify the ground shaking caused by an earthquake.

- **Fundamental Periods**

Every structure has its own fundamental period or natural vibration. If the vibration of ground shaking coincides with the natural vibration period of a structure, damage to the structure can be greatly increased. The extent of damage suffered during an earthquake can also depend on non-geologic factors. The type of building and its structural integrity will influence the severity of the damage suffered. Generally, small, well-constructed, one and two-story wood and steel frame buildings have performed well in earthquakes because of their light weight and flexibility. Reinforced concrete structures also usually perform well. Buildings constructed from non-flexible materials, such as unreinforced brick and concrete, hollow concrete block, clay tile, or adobe, are more vulnerable to earthquake damage.

Impacts on People and Housing

In any earthquake, the primary consideration is saving lives. Time and effort must also be dedicated to providing for social issues such as reuniting families, providing shelter to displaced persons, and restoring basic needs and services. Major efforts will be required to remove debris and clear roadways, demolish unsafe structures, assist in reestablishing public services and utilities, and provide continuing care and temporary housing for affected citizens.

Effects on Commercial and Industrial Structures

After any earthquake, individuals are likely to lose wages due to the inability of businesses to function because of damaged goods and/or facilities. With business losses, the County of



San Luis Obispo will lose revenue. Economic recovery from even a minor earthquake will be critical to the communities involved.

Effects on Infrastructure

The damage caused can lead to the paralysis of the local infrastructure: police, fire, medical and governmental services.

Effects on Agriculture

Earthquakes can cause loss of human life, loss of animal life, and property damage to structures and land dedicated to agricultural uses. The most significant long-term impacts on agriculture from earthquakes are those that arise from the cascading effects of fire and flood.

Unreinforced Masonry Buildings

Unreinforced masonry building type structures consist of buildings made of unreinforced concrete and brick, hollow concrete blocks, clay tiles, and adobe masonry. Buildings constructed of these materials are heavy and brittle, and typically provide little earthquake resistance. In small earthquakes, unreinforced buildings can crack, and in strong earthquakes, they have a tendency to collapse. These types of structures pose the greatest structural risk to life and safety of all general building types. Non-structural items and building components can also influence the amount of damage that buildings suffer during an earthquake. Unreinforced parapets, chimneys, facades, signs, and building appendages can all be shaken loose, creating a serious risk to life and property.

Compliant with the State of California's Alquist-Priolo Special Studies Zone Act, the inventorying and public notification of these structures, based on the probability of a damaging quake occurring, is required. Only two of these structures can be found in the study area, both located in the commercial district along Front Street. They both present a very limited public safety threat as they are small and not used for public occupancy.

Relationship to Other Hazards – Cascading Effects

Earthquakes can cause many cascading effects such as fires, flooding, hazardous materials spills, utility disruptions, landslides, and transportation emergencies. Ground shaking may cause tsunamis or seiche, the rhythmic sloshing of water in lakes or bays. Economic impacts to a community through the loss of property and sales tax revenues from damaged businesses can be significant.



Plans and Programs in Place

The San Luis Obispo County Office of Emergency Services (OES) and the Five Cities Fire Authority (FCFA) in coordination with local, state, and federal emergency response organizations, continually work to better prepare the District's residents for the impacts of a significant earthquake event.

The San Luis Obispo County Planning and Building Department ensures that all new construction complies with current codes and ordinances regarding earthquake safety within the District.

First responder agencies regularly train on building collapse awareness, light rescue techniques, mass casualty triage and treatment, and have a limited amount of equipment and resources available to facilitate heavy rescue operations.

A detailed Earth Response Plan for San Luis Obispo County is in place, developed by the Office of Emergency Services. The Plan is coordinated with the State of California Earthquake Plan.

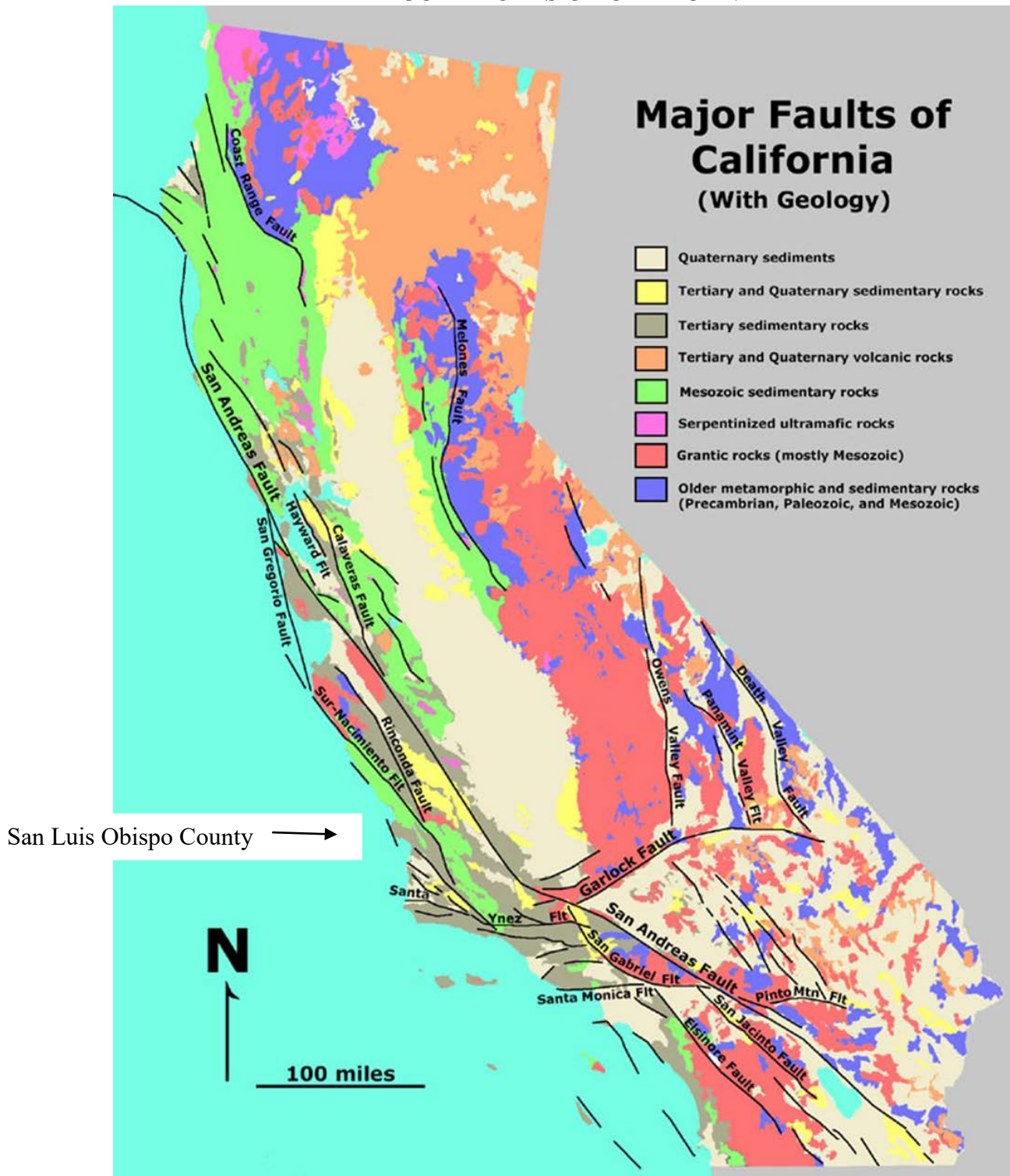
Future Probability - Risk Assessment Conclusion

Over the past 100 years, 13 earthquakes of magnitude 5 or greater have occurred within the County and/or surrounding areas. Based on this historical data of damaging earthquakes and the fact that District is located within a seismically active region, the probability is rated **HIGH**.

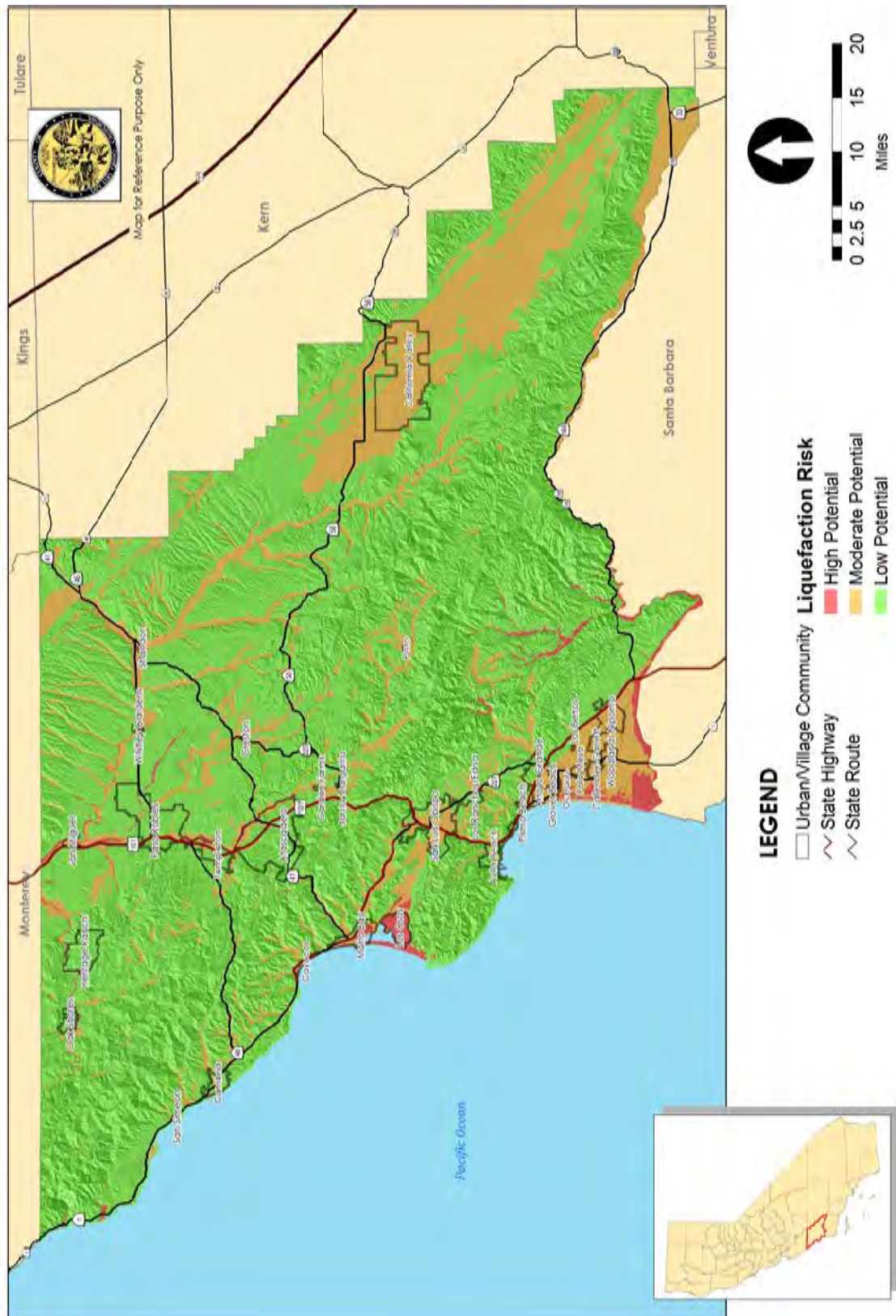
Both direct and indirect consequences of a major earthquake will severely stress the resources of the both the District, the FCFA, and the County and will require a high level of self-help, coordination and cooperation. Outside assistance from other local, regional, state, federal and private agencies may be delayed by more than 72 hours, depending upon the regional severity of the earthquake. Given the properties at risk and the cascading effects the severity is rated as **HIGH**.



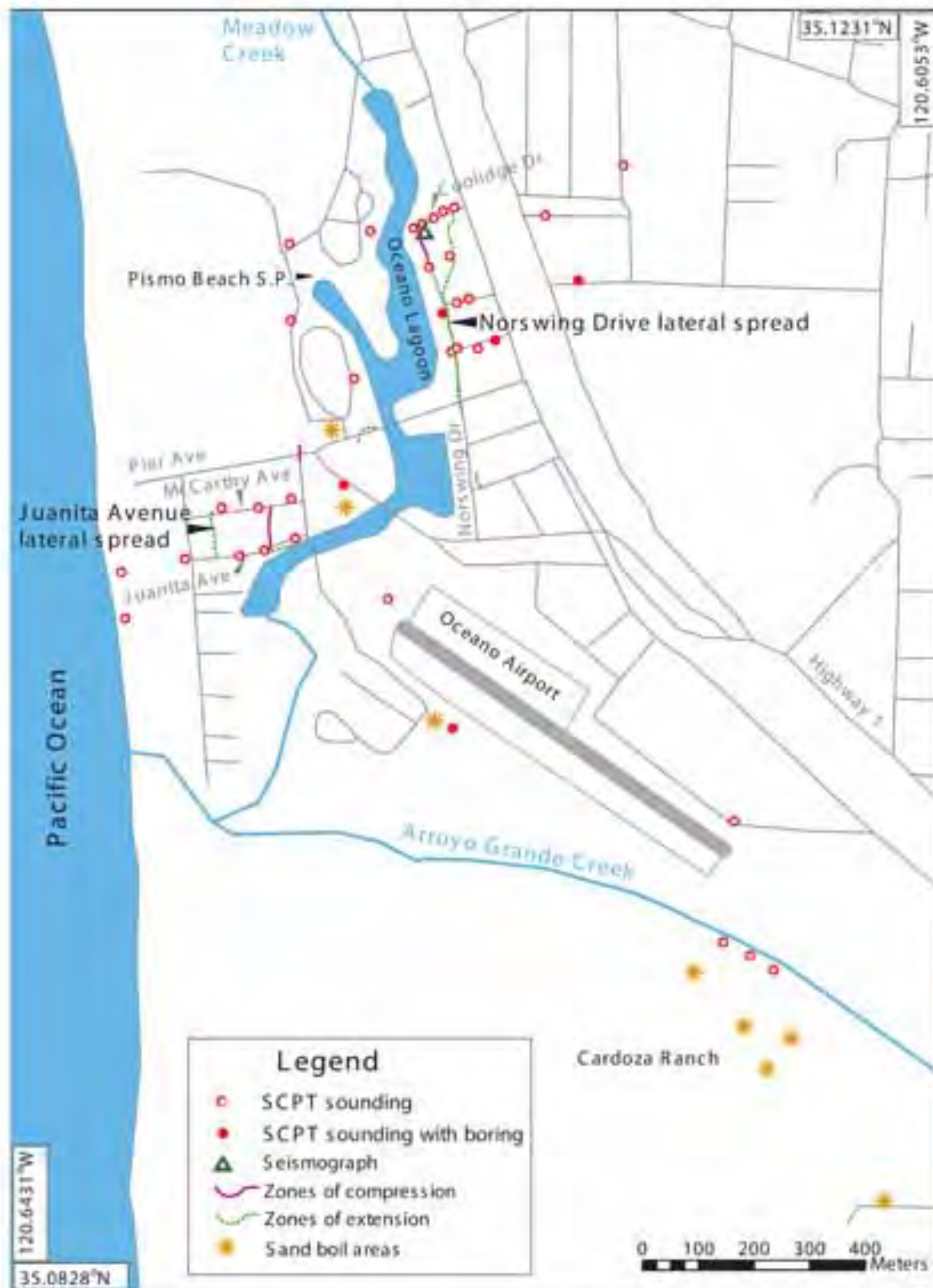
MAJOR FAULTS OF CALIFORNIA







LIQUEFACTION RISK MAP



Map of Oceano with Ground Failure and Liquefaction Areas, USGS SCPT Soundings and Borings, and Portable Digital Seismograph



➤HAZARD: FLOODING

Severity: Medium	Probability: High
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Hazard Definition

A flood is defined as an overflowing of water onto an area of land that is normally dry. Floods generally occur from natural weather related causes, such as sudden snow melts, often in conjunction with a wet or rainy spring, or with sudden and very heavy rainfall. Floods can also result from human causes such as a dam impoundment bursting.

Rainfall and inclement weather are primarily seasonal phenomena in the study area which boasts a mild Mediterranean climate. Generally the rainy season is from November through March. The yearly rainfall average for Oceano is just less than 18 inches, however much higher amounts can be expected in the coastal mountains to the east, for example Lopez Lake will often receive double that amount in a year. Even during moderately sized storms, flooding can also occur in low-lying areas that have poor drainage an example being Highway 1 between 13th and 17th streets in Oceano.

Many factors can increase the severity of floods including: fires in watershed areas, the placement of structures or fill material in flood-prone areas, and tidal or storm influence in low-lying coastal areas. Additionally, the construction of impervious surfaces such as roadways and rooftops will result in increased runoff.

Sea level rise due to global warming is likely to have minimal flood impact on most of the community of Oceano due to protective sand dunes and the overall elevation of most of the community. However, two areas of concern exist: the protective sand dunes are breached by the Pier Avenue beach ramp and the Arroyo Grande Creek at its terminus at the Pacific Ocean. The potential for water to enter the marsh area behind the dunes is high. A more detailed description and current plans and projects in place can be found in the Tsunami portion of this Plan.

For floodplain management purposes, the Federal Emergency Management Agency (FEMA) will often use the term "100-year flood" to describe the size or magnitude. These terms are misleading. It is not a flood that occurs once every 100 years. Rather, it is the flood elevation that has a 1 percent chance of being equaled or exceeded each year. Thus, a 100-year flood could occur more than once in a relatively short period of time.

The 100-year flood, which is the standard used by most federal and state agencies, is used by the National Flood Insurance Program (NFIP) as the standard for floodplain management and to determine the need for flood insurance.

Oceano Community Services District Local Hazard Mitigation Plan



Areas within the 100 and 500-year flood plain of the study area are found in the San Luis Obispo County Flood Hazard Map found in at the end of this section.

Monthly Rainfall Averages (Annual = Approximately 15 inches/year)

MONTHLY AVERAGES AND RECORDS- °F						
Date	Average Low	Average High	Record Low	Record High	Average Precipitation	Average Snow
January	43°	65°	24° (1950)	85° (1976)	3.59"	0"
February	44°	66°	28° (1996)	90° (1995)	3.87"	0"
March	45°	67°	23° (1963)	90° (2000)	3.46"	0"
April	46°	69°	31° (1999)	101° (1989)	1.13"	0"
May	47°	70°	30° (1988)	100° (1970)	0.41"	0"
June	51°	71°	37° (1999)	99° (1976)	0.07"	0"
July	53°	71°	38° (1949)	104° (1953)	0.03"	0"
August	53°	72°	39° (1963)	108° (1962)	0.02"	0"
September	53°	73°	35° (1988)	100° (1966)	0.32"	0"
October	51°	73°	32° (1949)	99° (1964)	0.62"	0"
November	46°	69°	29° (1986)	91° (1997)	1.7"	0"
December	42°	66°	24° (1990)	92° (1958)	2.57"	0"



History

Over the years, the study area has experienced flooding events that have resulted in extensive property damage. Historical floods in the District and surrounding areas include:

January and February, 1969

In January of 1969, a series of storms delivered rainfall that totaled over 18 inches in the coastal areas of the county. In February, another series of storms delivered another 5 to 10 inches. Streets, highways, and utilities throughout the County were heavily damaged.

January, 1973

Much like the floods of 1969, the 1973 storm produced a ten-hour period of unusually heavy rainfall. Many creeks and streams throughout the county overtopped their banks and inundated a number of areas.

February 22, 1993

Cambria received 2.5 inches of rain in a two hour period. Flash flooding occurred causing \$500,000 damage to four businesses and several residences.

January and March, 1995

A series of powerful and slow-moving storms brought heavy rain and strong winds to all of Central California. Serious flooding occurred in all coastal and many inland streams. In March, 18 inches of rain fell in Cambria and the West Village was completely inundated, with water as deep as six feet on Main Street.

December 2005 and early January, 2006

A series of storms battered the County. Most of the damage occurred New Year's Eve and day. High winds and saturated soils resulted in significant tree falls throughout the county causing heavy damage to a number of homes and businesses. There was one fatality which was the result of a tree falling on a pick-up truck while it was traveling on U.S. Highway 101.

March, 2001

Central and Southern California were significantly impacted by a powerful storm that delivered up to 6 inches of rain in some of the coastal areas of San Luis Obispo County. The mountain area of the county received even more, with reports of up to 13 inches. The heavy rain produced numerous flooding incidents. In Oceano, the Arroyo Grande Creek overflowed, destroying numerous crops and damaging one home. The Pacific Dunes RV



Park flooded. In Arroyo Grande, flooding along Corbett Creek caused damage to four homes and five classrooms at Arroyo Grande High School. In Pismo Beach, Pismo Creek flooding damaged homes in Pismo Coast Village.

December, 2004

A quick moving and powerful storm brought flash flooding and heavy rain to the Central Coast of California. Rainfall amounts ranged from 1 to 3 inches on the coastal plains to 3 to 6 inches in the more mountainous regions of the county. Flooding problems were reported throughout the county.

December, 2010

A series of slow-moving storms brought heavy rain and strong winds to the County. The most severe damages began on December 19, with primarily affected areas in the South County, particularly in the Oceano area. Damages reported to Cal EMA were just over \$2,000,000 in private property losses and an estimated cost and loss total to local governments of just over \$1,100,000 for a total storm damage cost estimate of approximately \$3,135,000.

February, 2017

Wind storm resulted in the downing of 15-20 large eucalyptus, cypress and pine trees in the village of Halcyon.

Annual Basis

Relatively moderate rain storms cause flooding along Highway 1 from 4th to 13th street. (*See photo at end of this section*)

Flood Hazard Potential

Flooding in Oceano is a result of heavy flows in Arroyo Grande Creek and Meadow Creek. The most significant inundation area is near the creeks' confluences with the ocean. Areas subject to flooding as a result of a 100-year storm generally extend south of Highway 1 and west of Pier Avenue. During a major event flooding would occur at the Oceano County Airport and surrounding properties, along with extensive areas located to the south of the community.



On nearly an annual basis, the low lying areas of Oceano, specifically the areas mentioned above will flood even in moderate rain storms. The County of San Luis Obispo and the Flood Control District have initiated two projects to mitigate some of the flooding. One project will address the flooding along Hwy 1 at 13th street where the most frequent and potentially dangerous flooding occurs on a regular basis. The project will construct drainage facilities (culverts and basins) that will convey run-off from Hwy 1 and 13th Street to the Arroyo Grande Creek Channel. This project has received funding from Caltrans, Community Development Block Grants, SLO Council of Governments, and the County but quotes received for the project exceeded the original engineers' estimate and the project is now looking to obtain a long term loan from USDA to make up the shortfall. Due to the number of agencies involved such as the federally regulated Oceano Airport and Union Pacific Railroad, and proximity to riparian habitat the permitting and coordination effort has been complex and time consuming. The second project the County initiated via Zone 1/1A is the Arroyo Grande Creek Channel Waterway Management Project. This project will help reduce the risk of the channel overtopping in certain storms by restoring the flood capacity of the channel while maintaining critical habitat for at least two endangered species. This project has received \$6.8 million dollars in grants from the State and FEMA. The project is in the final design phase and implementation of the project should occur in the next 1-2 years. Once these two projects are completed, they will eliminate the frequent flooding of two structures existing along Highway 1 between 13th Street and Front Street. Flooding of consequence occurs nowhere else in the District.

- **Effects on People and Housing**

Direct impacts of flooding can include injuries and loss of life, damage to property and health hazards from ruptured sewage lines and damaged septic systems. Secondary impacts include the cost and commitment of resources for flood fighting services, clean-up operations, and the repair or replacement of damaged structures.

- **Effects on Commercial and Industrial Structures**

Flooding can cause damage to commercial and industrial structures, vegetation, crops and livestock. Beach erosion results in the loss of sand from coastal areas. This hazard can accelerate the rate of erosion of coastal bluffs, and can also contribute to increased wave-related damage to coastal structures.

- **Effects on Infrastructure**

Flooding can cause damage to roads, communication facilities and other infrastructure.

- **Effects on Agriculture**

Effects on agriculture can be devastating. Flooding can damage crops and livestock. In addition to the obvious impacts on crops and animals, flooding can have deleterious effects on soil and the ability to reinvigorate the agricultural activities impacted once the flood



waters recede. Damage to water resources such as underground irrigation systems, water storage reservoirs, springs and other natural water bodies could have a serious effect upon agriculture operations.

Dam Failure

Although the probability of this type of hazard occurring is highly unlikely, it warrants consideration because a considerable portion of Oceano is located in the inundation area of Lopez Dam. In the event of complete failure of Lopez Dam, at 100% capacity, water would flow in a westerly direction following Arroyo Grande Creek, approximately 3,000 feet in each direction of the centerline of the creek channel. Water flows would pass through the rural areas directly below the dam and then into the cities of Arroyo Grande, Grover Beach, and the community of Oceano, some schools within the Lucia Mar Unified School District and the Sanitation District before reaching the ocean. Substantial impacts to life and property are a significant possibility in the City of Arroyo Grande. The threat diminishes as the distance from the dam increases and as the flood plain widens as it approaches Grover Beach. In Grover Beach, if the Lopez Dam were at full capacity and experienced a total failure, the low lying areas south of Grand Avenue and west of Highway 1 would be impacted. In Oceano, the inundation is predicted to follow the 100 year flood map and would include Highway 1, the Oceano Elementary School, Oceano Airport, the rail system, and Oceano Campground.

The County Dam and Levee Failure Plan indicates that at 100% capacity and with a complete failure water would reach U.S. 101, just north of the community of Oceano in approximately 40 minutes.

The State of California Division of Safety of Dams (DSOD) conducts periodic reviews to evaluate dam safety and a considerable amount of work was completed in 2004 in order to bring the dam into compliance with current seismic standards and mitigate the potential for liquefaction of the underlying subsoils found in the creek bed below the Lopez Dam. Inundation maps are in the process of being updated and will be public after DSOD approves the new maps.

Please see Flood Zone Map found at the end of this section.



Levee Failure

The area to the east and south of the District consists of the Arroyo Grande Creek flood plain. It is also referred to as the Cienaga Valley. The area is prime farmland and is in constant production, having a significant agricultural economic impact.

In 1961, the Arroyo Grande Creek Flood Control Project was completed. The main feature of the project was a levee system that confines the lower 3 miles of Arroyo Grande Creek, and a portion of Los Berros Creek as they flow to the Pacific Ocean. Over the years, the system has lost much of its carrying capacity and in 2001, the southern portion of the Arroyo Grande levee was breached near the Union Pacific railroad bridge. This failure resulted in extensive flooding of hundreds of acres of farmland. Should the northern portion have failed, the results would have been dramatic. The communities of Grover Beach and Oceano as well as the campgrounds, airport, and wastewater treatment plant would have been at risk.

Relationship to Other Hazards - Cascading Effects

While there are some benefits associated with flooding, such as the replenishment of beach sand, and the supplement of nutrients to agricultural lands, it is generally considered a hazard to development in flood plain areas. Floods can cause many cascading effects. Fire can break out as a result of dysfunctional electrical equipment. Hazardous materials can also get into floodways, causing health concerns and polluted water supplies. In many instances during a flood, the drinking water supply will be contaminated. Other problems and hazards associated with flooding and inclement weather include: utility disruptions, broken power lines lying on the ground, and communication system failures.

High winds often accompany winter storms and may cause significant damage in the planning area by blowing down trees that have been killed or damaged by drought, disease or insect infestation. The eucalyptus trees found along Highway 1 and the railroad present and in scattered locations throughout the planning area present a moderate threat to the community.

Plans and Programs in Place

San Luis Obispo County Public Works Department, Office of Emergency Services (OES), and the Five Cities Fire Authority, in coordination with local, state, and federal emergency response organizations, continually work to better prepare residents of Oceano for the impact of flooding events. The Flood Control and Water Conservation District annually sends out a Flooding and Evacuation Brochure detailing important safety information to all of the residents of Oceano.



First responder agencies, both law enforcement and fire, regularly train on water rescue and dealing with the cascading effects that can result from flooding. The local chapter of the American Red Cross is prepared to assist citizens in shelter welfare issues.

The San Luis Obispo County Planning and Building Department stipulate and enforces codes and ordinances that ensure that buildings are not situated in flood zones.

It should be noted that the community of Oceano, along with all of San Luis Obispo County's unincorporated areas, are included in the National Flood Insurance Program (NFIP), which allows property owners in flood prone areas very reasonable flood insurance rates. The County of San Luis Obispo is committed to remaining a NFIP participating agency and the projects currently in the planning and permitting phases will eliminate the repetitive flooding of the NFIP structures in the community.

Flood Control Districts

The San Luis Obispo County Flood Control and Water Conservation District has three subsidiary zones of benefit, two of which have direct impact on flooding within the community of Oceano. The Arroyo Grande Creek - Zone 1 and Los Berros Creek - Zone 1/A Districts primary focus is the maintenance of the Arroyo Grande Creek Flood Control Channel. Additionally, they are also concerned with the flooding, erosion, water quality within the boundaries of Zone 1 and 1A. The third zone, Zone 3 deals with the impacts of dam failure and drought.

In September of 2006, the OCSD signed on as a party to the Arroyo Grande Watershed and Memorandum of Understanding (MOU). The purpose of the MOU is to provide an overall understanding and accountability consensus between the parties to better protect, manage, and enhance the watershed, creating a sustainable future for the surrounding communities and the environment.

In 2010, a long-term maintenance plan for the Arroyo Grande Creek Channel was developed and funded by Zone 1 and 1A. This plan is called the Arroyo Grande Creek Channel Waterway Management Program (AGWMP). The AGWMP was adopted and the associated Environmental Impact Report was certified by the Board of Supervisors on November 2, 2010.

National Weather Service

The National Weather Service uses a number of methods to get weather statements out to the general population. Examples include the Emergency Alert System, NOAA Weather Radio All Hazards (NWR), and smart phone Wireless Emergency Alerts (WEA). For certain



significant extreme weather events, the County could potentially use the reverse 9-1-1 system. An Early Warning System siren, located throughout the Diablo Canyon Emergency Planning Zone Area, which includes the Oceano area, could be utilized to alert residents to a flooding event.

Due to the unique and consistent weather patterns in the area, the National Weather Service (NWS) has broken the County into three weather forecast zones: San Luis Obispo County Central Coast, San Luis Obispo County Interior Valleys, and San Luis Obispo County Mountains. The NWS uses a multi-tier system of weather statements to notify the public of threatening weather conditions specific to these areas. These statements are used in conjunction with specific weather phenomena to convey different levels of risk. In order of increasing risk, these statements are:

Weather Related Terminology

- **Outlook** - A Hazardous Weather Outlook is issued daily to indicate that a hazardous weather or hydrologic event may occur in the next several days. The outlook will include information about potential severe thunderstorms, heavy rain or flooding, winter weather, extremes of heat or cold, etc., that may develop over the next seven days with an emphasis on the first 24 hours of the forecast. It is intended to provide information to those who need considerable lead time to prepare for the event.
- **Advisory** - An advisory is issued when a hazardous weather or hydrologic event is occurring, imminent, or likely. Advisories are for "less serious" conditions than warnings that may cause significant inconvenience, and if caution is not exercised could lead to situations that may threaten life or property. The NWS may activate weather spotters in areas affected by advisories to help them better track and analyze the event.
- **Watch** - A watch is used when the risk of a hazardous weather or hydrologic event has increased significantly, but its occurrence, location, or timing is still uncertain. It is intended to provide enough lead time so those who need to set their plans in motion can do so. A watch means that hazardous weather is possible. People should have a plan of action in case a storm threatens and they should listen for updates and possible warnings especially when planning travel or outdoor activities. The National Weather Service may activate weather spotters in areas affected by watches to help them better track and analyze the event.
- **Warning** - A warning is issued when a hazardous weather or hydrologic event is occurring, imminent, or likely. A warning means weather conditions pose a threat to



life or property. People in the path of the storm need to take protective action. NWS may activate weather spotters in areas affected by warnings to help them better track and analyze the event.

- **Statement** - A statement is either issued as a follow-up message to a warning, watch, or emergency, and may be updated, extended, or cancelled. It is also a follow-up message or notification of significant weather for which no type of advisory, watch, or warning exists.

Future Probability/Risk Assessment Conclusion

While it is impossible to predict future long-range weather patterns, it is certain that the location of the study area adjacent to the Pacific Ocean and surrounded by the mountains to the east will continue to have a significant exposure to major winter storms and flooding.

The vast majority of the study area is well drained being situated on gently sloping terrain with soils that allow for good drainage. Drainage problems in most of these gently sloped areas are a result of improper grading and are minor in nature. While the area is well drained, in that it is mostly located over sand, the presence of high groundwater levels minimize the ability of the soil to absorb much of the storm water runoff and nuisance flooding will occur.

Because a considerable amount of resources have already been expended toward resolving flood issues in these areas and because of the minimal threat to loss of life, flooding has been deemed a **MODERATE** severity risk. The study area has a significant history of flooding and therefore has received a **HIGH** probability rating.



January 2017-A portion of Highway 1 in Oceano is closed due to flooding.



OCEANO, CA 100-YEAR FLOOD PLAIN





➤HAZARD: TSUNAMI

Severity: Medium	Probability: Low
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Hazard Definition

A tsunami is a wave, or a series of waves, caused by a displacement of the ocean floor, usually by movement along a fault. In deep ocean water, tsunamis may travel as fast as 600 miles per hour. As they approach the shore, waves may increase in size and can cause extensive damage to coastal structures.

Withdrawal of the sea may be a precursor to the arrival of the first wave. After the first wave appears, waves may continue to arrive at intervals for several hours. Intervals between successive waves may be similar. If the second wave appears 20 minutes after the first, it is likely that a third wave (if there is one) would arrive 20 minutes after the second. The first wave may not be the biggest. Yet the largest wave usually occurs within the first ten waves. The primary effects of these waves can be widespread destruction and damage to coastal structures and flooding of low lying areas. The height the sea level rises above mean high tide line is referred to as run-up.

History

While there is no recorded history of tsunami damage to the study area, tsunamis have caused considerable damage to neighboring communities located on the California Coast, including the City of Morro Bay which is located in San Luis Obispo County. A tsunami in 1964, following an earthquake in Alaska, killed 12 people in Crescent City and damaged piers and boats in Morro Bay as the bay emptied and filled every 15 minutes for over an hour.

On March 11, 2011, a 9.0 magnitude earthquake struck northern Japan. Nearly 12 hours later, approximately \$500,000 in damage was recorded to piers and docks in Morro Bay as a result of a tsunami from this earthquake. At the Center of Coastal Marine Science in Morro Bay (near the back of the bay), an oceanographer recorded a 6 foot surge, while fishermen and Coast Guard personnel estimated an 8-9 foot surge at the Coast Guard pier near the entrance to the harbor.



Tsunami History- San Luis Obispo County

Location of Damage	Incident Date	Intensity	Information
Morro Bay	1868	Unknown	Unknown
Cayucos	4/16/1877	Height: 3.6 meters	Unknown
Morro Bay	1878	Unknown	Unknown - Reportedly overtopped the sand spit in low areas
Pismo Beach	1927	Height: 1.8 meters	Unknown
Avila Beach	4/1/1946	Height: 1.3 meters Source magnitude: 7.3 Ms	Tsunami source location: Alaska Source event: E. Aleutian Islands Travel time: 5 hours 36 minutes
Morro Bay	4/1/1946	Height: 1.5 meters Source magnitude: 7.3 Ms	Tsunami source location: Alaska Source event: E. Aleutian Islands Travel time: 5 hours 36 minutes
Avila Beach	11/4/1952	Height: 1.4 meters Source magnitude: 8.2 Ms, 9 Mw	Tsunami source location: Russia Source event: Kamchatka Travel time: 8 hours 36 minutes
Pismo Beach	5/22/1960	Height: 1.4 meters Source Magnitude: 9.5 Mw	Tsunami source location: Chile Source event: Central Chile
Avila Beach and Morro Bay	3/28/1964	Height: 1.6 meters Source magnitude: 9.2 Mw	Tsunami source location: Alaska Source event: Gulf of Alaska. Travel time: 5 hours 10 minutes
Morro Bay	3/11/2011	Height: 2.4 Meters Source magnitude: 9.0 Mw	Tsunami source location: Japan Source event: Tōhoku earthquake Travel time: 10 hours 32 minutes



Hazard Potential

As noted in the above table, the historic record shows that significant tsunamis typically have been generated from distant earthquake sources. It has been estimated that the 100 and 500 year tsunami run-ups in the study area are based on far-field source generation locations (such as the Aleutian or Chile-Peru Trenches). Estimated tsunami run-up along the San Luis Obispo County coastline is approximately 9.5 feet to 24.2 feet for the 100 year and 500 year events, respectively. Those run-ups were calculated using astronomical high tides, and compare well with recorded tsunamis that have occurred in other locations along the California Coast. However, the worst case scenario would be if a tsunami occurred during a meteorological high tide (storm surge), which would add an estimated 14.5 feet (4.5 meters) to the run-up values calculated. In this worst case scenario, the estimated tsunami run-up for the 100 year and 500 year would be approximately elevation 24 and 39 feet above mean sea level, respectively.

The Davidson Seamount is located approximately 70 miles NW of Cambria, and is 4,101 feet beneath the Pacific Ocean's surface. This mount rises 7,480 feet up from the ocean floor and is 23 miles long and 7 miles wide. A sub-surface landslide on this or any other nearby undersea feature would not allow adequate time to notify/warn San Luis Obispo County coastal residents to evacuate. While very unlikely to occur, an undersea landslide here could be devastating to coastal areas of San Luis Obispo County.

The Tsunami Response Plan for San Luis Obispo County uses as its planning basis all those coastal communities, recreation and developed areas with an elevation of 50 feet above mean sea level. In general, much of the coast of the County is protected by wide beaches, coastal dune, or sea cliffs that provide protection for coastal developments. Areas most vulnerable to the tsunami hazard are developments or infra-structure near the mouths of streams that drain into the Pacific Ocean. In the District and immediate area this would include:

- Pismo Creek in Pismo Beach
- Meadow Creek and Arroyo Grande Creek in Oceano
- The Pier Avenue beach ramp in Grover Beach

Most of Oceano and Halcyon is protected from flooding by the Oceano Dunes. Arroyo Grande Creek breaches the dunes just outside the District's east boundary terminating at the Pacific Ocean. At its terminus the creek is very wide with a very shallow gradient. This would allow tsunami waves to travel upstream flooding adjoining creeks and flood control channels found within the low lying areas of the District. The worst case scenario would transpire if a tsunami occurred during a meteorological high tide combined with a storm surge which could add 14.5 feet to the wave height.



Specific at-risk locations within Oceano and Halcyon and immediate adjoining areas include the following:

- From Highway 1 (Pacific Boulevard or Front Street) to the ocean and south of Cienaga from 19th Street to Valley Road
- This would include the Oceano State Park Campground, Pismo State Beach, Oceano County Campground, Oceano Airport and the Oceano Dunes State Recreational Vehicle Park
- All farm land and areas around Oso Flaco Lake
- The wastewater treatment facilities of the South San Luis Obispo County Sanitation District which is located on Meadow Creek.

The primary impacts of a tsunami event can be widespread destruction and damage to coastal structures and flooding of low lying area. Other effects include:

- **Effects on People and Housing**
There is a low probability that a tsunami event would cause significant property damage or loss of life within the District as most developed areas are well above the estimated run up elevation and a sophisticated warning system is in place.
- **Effects on Commercial and Industrial Structures**
There is a very limited amount of development in the tsunami inundation zones within the District. However neighboring Port San Luis and Morro Bay could be impacted in terms of property damage to piers, docks, floats, and to moored boats. The Diablo Canyon Power Plant is not considered to be at risk as it is located on a marine terrace 85 feet above the sea level. The cooling intakes and release structures for the plant, which are located at sea level, are protected by natural barriers and a concrete jetty.
- **Effects on Infrastructure**
A tsunami event can cause damage to roads, communication facilities, and other infrastructure.
- **Effects on Agriculture**
Effects on agriculture could be devastating if flooding of fields were to occur as a result of a tsunami traveling up and overbanking Arroyo Grande Creek.



Relationships to Other Hazards – Cascading Effects

Tsunami events can cause many cascading effects. Fire can break out as a result of damaged electrical equipment. Other problems and hazards associated with tsunami flooding include: utility disruptions, contamination of the water supply system, broken power lines lying on the ground, and communication system failures.

Plans and Programs in Place

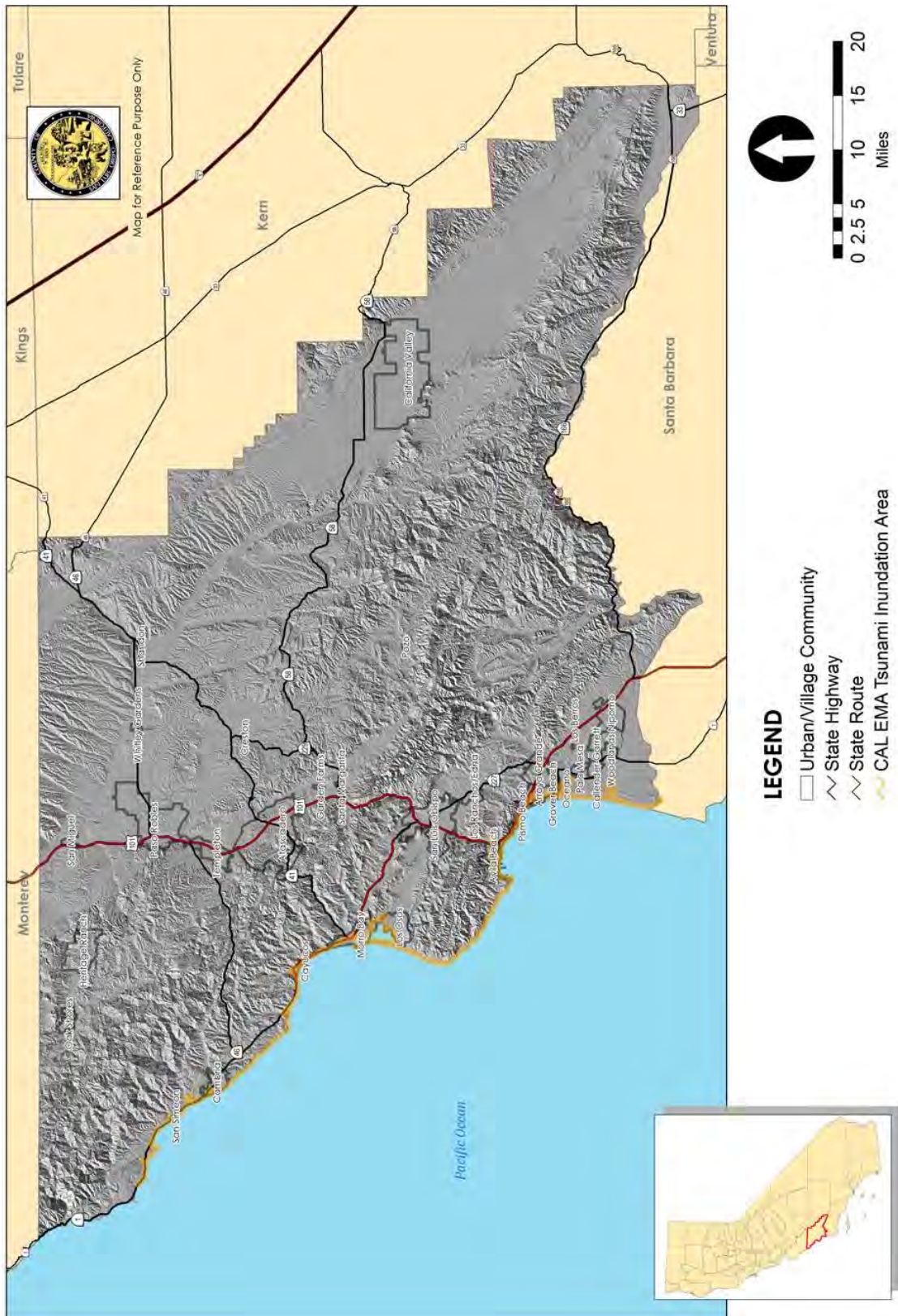
A detailed Tsunami Response Plan for San Luis Obispo County is in place. The Plan addresses the coastal communities, recreation facilities and developed areas with an elevation of 50 feet or less above mean sea level.

The West Coast/Alaska Tsunami Warning Center in Palmer, Alaska is responsible for issuing tsunami information for California, Oregon, Washington, and British Columbia. Tsunami generating incidents around the Pacific can be detected, pinpointed and magnitude computed in from 2 to 12 minutes depending upon the distance from the warning center. Depending on the incident magnitude a “Watch,” “Advisory” or “Warning” will be transmitted to the Governor’s Office of Emergency Services and then distributed through the County’s Emergency Alerting System.

It should be noted that the California Coastal Commission has approved and permitted a 30 year plan to construct flood walls/berm to protect the South San Luis Obispo County Sanitation District Wastewater Treatment Facility located on Meadow Creek. This project will provide protection from both sea level rise and tsunami flooding at the low lying breaches at the Oceano Dunes.

Future Probability - Risk Assessment Conclusion

As delineated in the Risk Assessment above, there are a limited number of low lying areas in the District that could be impacted by a significant tsunami event. Historically, the study area has had minimal threat from tsunami activity. Thus, the probability of this future hazard event occurring is deemed **LOW**. The combination of an accurate tsunami warning system, which will provide time for evacuations, and the limited exposed area reduces the severity to some degree. However, given the fact that the community’s wastewater treatment facility is located within the tsunami inundation zone justifies a **MEDIUM** severity rating. *A San Luis Obispo County Tsunami Hazard inundation map is found at the end of this section.*



TSUNAMI HAZARD INUNDATION MAP



➤HAZARD: DROUGHT

Severity: Low	Probability: High
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Hazard Definition

A drought is an extended dry period where water availability falls below the statistical requirements for a region. Droughts are the product of natural water deficiency coupled with human water demand exceeding available supply. The precise definition of drought is made complex owing to political considerations, but there are generally three types of conditions that are referred to as drought:

Meteorological drought is brought about when there is a prolonged period with less than average precipitation.

Agricultural drought occurs when there is insufficient moisture for average crop or range production. This condition can arise, even in times of average precipitation, owing to soil conditions or agricultural techniques.

Hydrologic drought is brought about when the water reserves available in sources such as aquifers, lakes, and reservoirs fall below the statistical average. This condition can arise, even in times of average (or above average) precipitation, when increased usage of water diminishes the reserves.

When the word "drought" is used by the general public, the most often intended definition is meteorological drought. However, when the word is used by urban planners, it is more frequently in reference to hydrologic drought.



Lopez Lake, a critical water resource for the District during the drought of 2012-16



History

Droughts are a recurring feature of California's climate. In the last century, the most significant statewide droughts occurred in 1929-1934, 1976-1977, 1987-1992, and 2012-2016, and a less severe drought occurred in 2007-2009. The 2012-2016 drought was one of extreme proportions, with record-high temperatures and record-low levels of snowpack and precipitation. Fortunately, the District has not been impacted by these droughts.

Further information regarding these historical droughts is described below:

1929–1934

This drought occurred during the infamous Dust Bowl period of the 1920s and 1930s. As a result of this drought, the California Central Valley Project, which is a series of canals, aqueducts and pump stations, was constructed to deliver water from the northern half of the state to the San Joaquin Valley.

1976–77

1977 had been the driest year in California history to date. According to the *Los Angeles Times*, "Drought in the late 1970s spurred efforts at urban conservation and the state's Drought Emergency Water Bank was developed.

1986–1992

California endured one of its longest droughts ever, observed from late 1986 through late 1992. Drought worsened in 1988 as much of the United States also suffered from severe drought. In California, the six-year drought ended in late 1992 as a significant El Niño event in the Pacific Ocean remedied the situation.

2007–2009

This was the 12th worst drought period in California's history and the first drought for which a statewide proclamation of emergency was issued. The drought of 2007–2009 also saw greatly reduced water diversions from the state water project. The summer of 2007 saw some of the worst wildfires in Southern California history.

2011–2016

The period between late 2011 and 2016 was the driest in California history since record-keeping began. The drought led to Governor Jerry Brown instituting mandatory 25 percent water restrictions in June 2015. Many millions of California trees died from the drought – approximately 102 million, including 62 million in 2016 alone. It is estimated that throughout the State there was 2.7 billion dollars of lost farming revenue and the loss of some 18,000 jobs.



By the end of 2016, 30% of California had emerged from the drought, mainly in the northern half of the state, while 40% of the state, (Santa Barbara, Ventura, Los Angeles, Orange, and San Diego Counties) remained at extreme or exceptional drought levels.

The winter of 2016–17 turned out to be the wettest on record in Northern California, surpassing the previous record set in 1982–83. Floodwaters caused severe damage to Oroville Dam in early February, prompting the temporary evacuation of nearly 200,000 people north of Sacramento. In response to the heavy precipitation, which flooded multiple rivers and filled most of the state's major reservoirs, Governor Brown declared an official end to the drought on April 7, 2017.

Hazard Potential

Periods of drought can have significant environmental, agricultural, health, economic and social consequences. Drought can also reduce water quality, because lower water flows reduce dilution of pollutants and increase contamination of remaining water sources. In the planning area, which contains agricultural interests of consequence, the impacts of drought are significant.

As noted in the Hazard Definition above, no simple, precise definition of drought exists. In general, a drought is an extreme event characterized by a prolonged period of abnormally low levels of precipitation that has adverse impacts on vegetation, animals, and people. A drought is a temporary phenomenon and as such, it is distinct from aridity, which is a climatic feature of a particular region. Droughts occur periodically in every climatic zone, although some areas are more drought-prone than others. Such is the case with the community of Oceano. Situated above a large ground water basin and served by a number of water projects the community has, to date, not been impacted by drought. Please refer to the Risk Assessment Conclusion section for more detail.

Impacts and Effects

Listed below is a short summary of some of the effects and impacts that typically occur during a drought:

- **Water Supply and Quality**

Drought negatively impacts both the quantity and quality of water supplies. While a reduction in water supply is generally a temporary phenomenon, it can be permanent in some instances. Land subsidence can be caused by pumping, resulting in a permanent loss of groundwater storage. Drought can also compromise water quality, such as by concentrating salts and other contaminants, reducing dissolved oxygen levels, and increasing water temperatures. Water quality problems can exacerbate water supply problems.



- **Fish and Wildlife**

Political pressures increase diversions of water away from ecosystems. As water levels in streams, rivers, and lakes decline, fish and wildlife are at risk of dying, potentially causing regional extinctions. Dry vegetation combined with high temperatures and low humidity often increases the frequency and intensity of fires. The wildfire season may start earlier in the spring and extend later into the fall.

- **Energy**

Drought can strain the energy system. The generation of hydroelectricity at California dams may drop dramatically from average levels because it varies directly with streamflow. As the source of electricity production shifts to the more expensive fossil fuel (e.g., natural gas), electricity prices will likely increase. Additionally, high temperatures associated with drought may increase energy demand for cooling and air-conditioning systems.

- **Agriculture**

Some farmers and water districts with “junior” water rights have seen water allocations from state and federal irrigation projects severely cut. Some growers with “senior” water rights have seen only modest shortages, if any. Farmers facing a water shortage may seek temporary water transfers from other users, increase groundwater pumping, change the types of crops they grow, deficit irrigate, or leave some lands fallow.

- **Rural Communities**

Rural communities are often dependent on a single water source, usually groundwater. As groundwater levels drop, community and individual wells may go dry. Declining water supplies and ongoing water quality problems force communities to switch to bottled water, dig deeper wells, and truck in water to refill holding tanks. These actions can impose local economic hardships on those living in rural areas, many of whom are among the state’s most disadvantaged communities.

- **Revenue Losses**

For most water utilities, fixed costs (e.g., debt service on past water system investments) are relatively high and variable costs (e.g., energy and chemical costs) are relatively low. Reducing water use cuts variable costs but has no impact on fixed costs (at least in the short term). As water use declines, revenue from the sale of water also declines and may not be sufficient to recover the fixed costs. In response, water utilities may enact drought surcharges or draw from reserves. While surcharges increase the water rate (i.e., the price per gallon), those using less water may actually see their bills go down. Furthermore, conservation lessens the impact of the drought on water bills by avoiding the purchase of more expensive water supplies.



- **Behavioral Health**

Drought can impact behavioral health as a result of direct financial stress and general economic downturn. Additionally, some of the more common stress-relieving activities such as exercise and other outdoor activities may be impacted or less enjoyable as a result of drought. The combination of increased financial stress and impaired ability to relieve stress can result in the following behavioral health issues including depression, anxiety, suicide, and substance abuse.

Source: USGS - California Water Science Center

Relationships to Other Hazards-Cascading Events

Over pumping of groundwater basins due to drought conditions can result in land subsidence. As a result of drought, dry vegetation combined with high temperatures and low humidity often increases the frequency and intensity of fires. The wildfire season may now start earlier in the spring and extend later into the fall.

Plans and Programs in Place

Urban water utilities throughout the State of California have rolled out a wide range of voluntary and mandatory water conservation programs. These include education programs, incentives to purchase more water-efficient appliances and plant water-efficient gardens, and restrictions on discretionary water uses, such as watering lawns. As a result, statewide urban water use has declined by nearly 25% from 2013 levels.

When the Governor declared the drought emergency in January 2014, he provided direction to state agencies on several issues and called on all Californians to reduce water use by 25%. Subsequently, as the drought persisted, the State Water Board established mandates throughout California.

In October 2014, the Oceano Community Services District Board adopted Resolution 2014-15 in accordance with the State Water Board's requirements, which primarily establishes restrictions on outdoor water use. This action was taken not based on a true need but more in support of the neighboring communities who were being impacted by the drought.



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Future Probability - Risk Assessment Conclusion

While San Luis Obispo County has a well-documented history of being impacted by drought, the District has not suffered significantly. A number of factors mitigate the impacts of drought on the District. They include:

- The District has invested significant resources in a variety of water projects that provide three water sources for the District: Lopez Lake, the State Water Project, and ground water wells in the Arroyo Grande Basin.
- Although the Santa Maria Groundwater Basin, underlying the District, is an adjudicated basin and subject to the courts continuing jurisdiction, the District's pumping rights that were established in the court-approved stipulations and judgment of 900 acre feet per year, exceed the District's total annual demand.

Given these considerations, the severity for drought within the District is rated as **Low**. There is no doubt that this short term phenomenon will occur again therefore the probability is rated as **HIGH**.

U.S. Drought Monitor California

August 16, 2016

(Released Thursday, Aug. 18, 2016)

Valid 8 a.m. EDT

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	0.00	100.00	83.59	59.02	42.80	21.04
Last Week 8/9/2016	0.00	100.00	83.59	59.02	42.80	21.04
3 Months Ago 5/17/2016	5.50	94.50	86.39	63.57	42.99	21.04
Start of Calendar Year 12/29/2015	0.00	100.00	97.33	87.55	69.07	44.84
Start of Water Year 9/29/2015	0.14	99.86	97.33	92.36	71.08	46.00
One Year Ago 8/18/2015	0.14	99.86	97.35	92.36	71.08	46.00

Intensity

D0 Abnormally Dry	D3 Extreme Drought
D1 Moderate Drought	D4 Exceptional Drought
D2 Severe Drought	

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.

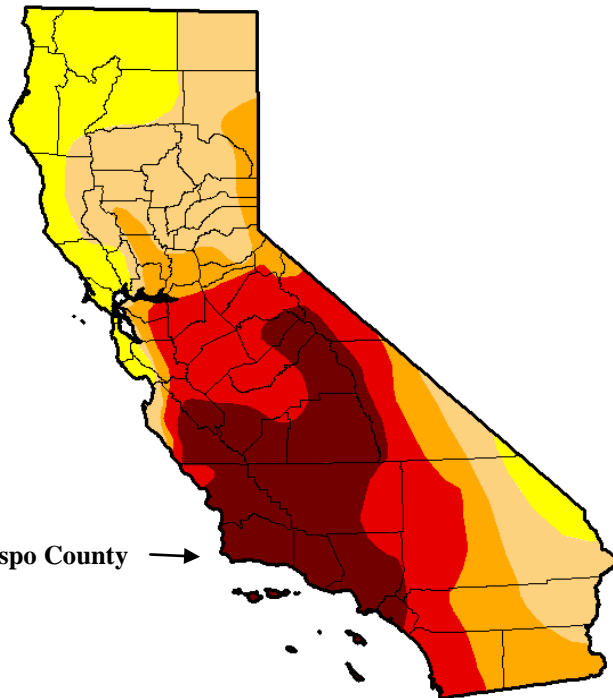
Author:

David Miskus

NOAA/NWS/NCEP/CPC

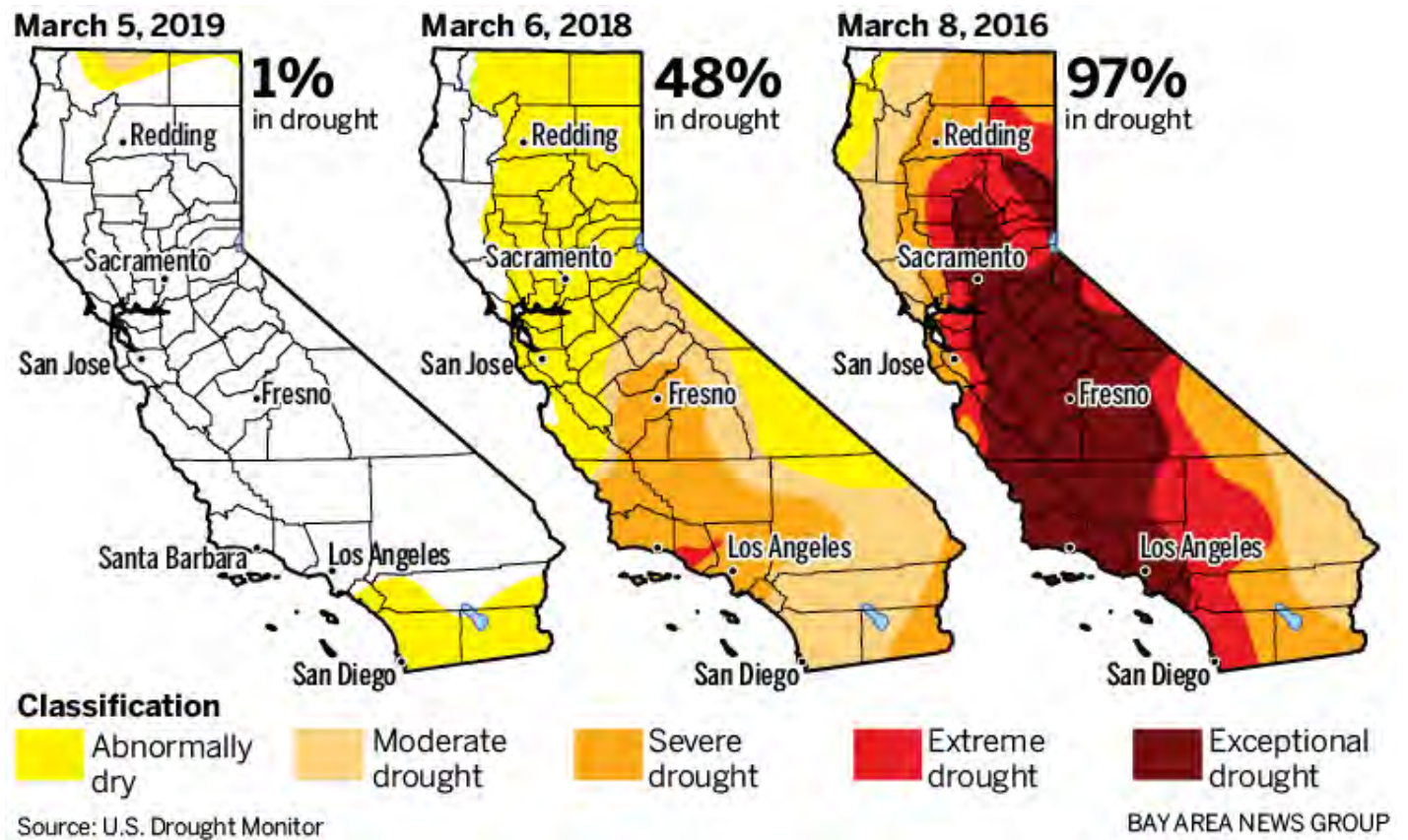


San Luis Obispo County →



<http://droughtmonitor.unl.edu/>

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As the above maps demonstrate, 97 percent of California's land was in a drought in March of 2016, much of it in extreme drought status. The historic drought that plagued California for five years ended in 2017 after extremely heavy rainfall enabling every major city in California to drop the mandatory water restrictions and penalties that marked much of the previous five years. Unfortunately, an extended dry period followed returning water restrictions to many California communities.



➤HAZARD: EXTREME WEATHER

Severity: Medium	Probability: High
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Hazard Definition

Extreme weather is defined as unusual, severe, or unseasonal weather. It can be considered weather at the extremes of the historical distribution or the range that has been experienced in the past. Adverse or extreme weather occurs only 5% or less of the time. It may take the form of isolated events, such as storms, or may occur over longer periods of time, such as heat waves, cold snaps, or drought.

A storm is defined as any disturbed state of the earth's atmosphere affecting its surface. It may be marked by strong wind, hail, thunder and/or lightning, heavy precipitation in the form of snow or rain, heavy freezing rain, strong winds (windstorm), or wind transporting some substance through the atmosphere as in a dust storm, blizzard, sand storm, etc. Storms generally lead to negative impacts to lives and property such as storm surge, coastal erosion, heavy rain or snow (causing flooding or road impassibility), lightning, wildfires, and vertical wind shear.

A more thorough discussion of these types of events follows:

Wind-Wind Storms

Resulting from air movement from areas of high pressure to those of low pressure, wind can occur at any time of the year and can vary in strength and duration. Wind related events can be quite destructive.

Heavy Snow Fall

Heavy snow fall will, on very rare occasions, occur in the higher elevations of the Santa Lucia range directly to the north and east of the District. In the lower elevations of the study area heavy snow fall does not occur.

Thunderstorm

A thunderstorm, also known as an electrical storm, lightning storm, or thundershower is weather characterized by the presence of lightning and its acoustic effect on the earth's atmosphere. Thunderstorms are usually accompanied by strong winds, heavy rain and



sometimes snow, sleet, hail, or no precipitation at all. Those which cause hail to fall are known as hailstorms.

Hailstorms

Hail is precipitation in the form of balls or irregular lumps, always produced by convective clouds, nearly always cumulonimbus. They can vary from pea size all the way up to that of a grapefruit in rare circumstances. Hailstones generally form in thunderstorms between currents of rising air called the updrafts and the current of air descending toward the ground, called the downdraft. Large hailstones indicate strong updrafts in the thunderstorm. The larger the hail, the stronger the updraft needed to hold it aloft in the storm.

Freeze

A freeze refers to a particularly cold spell of weather where the temperature drops below 32 degrees. Freezing conditions, especially in the spring, can cause damage to crops and ornamentals and cause considerable discomfort to area residents.

Extreme Heat

Often referred to as a “heat wave” or “heat storm”, it is typically defined as a series of days, three or more, where weather conditions combine resulting in day time temperatures considerably higher than the norm. When combined with high humidity, living conditions can become quite uncomfortable.



History

Oceano, Halcyon and neighboring communities have a history of adverse or extreme weather events:

Extreme Weather Event History

LOCATION	Date of Event	Damage Reported	Incident Description
San Luis Obispo County	1997 to Present: >20 Events Occurred	Unknown Values	Heavy Surf- 1998 event: An extended heavy surf event produced by a series of Pacific storms, battered coastal areas of Central and Southern California. Along the coast of San Luis Obispo, waves as high as 25 feet were reported. Elsewhere, coastal areas reported 12 to 15 foot waves producing some degree of damage. In Port San Luis, widespread shoreline erosion was reported.
City of San Luis Obispo	5/5/1988	4 homes damaged	Tornado-A small tornado developed over the City of San Luis Obispo. The tornado knocked out power to several hundred homes. Four homes were damaged, including one struck by a falling cypress tree.
Countywide	12/21/1998 - 12/24/1998	\$5.4 million crop damage	Freeze- An unseasonable cold air mass produced a three night period of sub-freezing temperatures across Central and Southern California. Agricultural interests suffered heavy crop losses.
San Luis Obispo County	12/17/2000 - 12/18/2000	Moderate	High Wind-Gusty offshore winds buffeted the coastal section of SLO County. In the City of SLO, the winds blew out the windows in an unoccupied mobile home and destroyed part of a car port. In Nipomo, winds of 35 mph with gusts up to 55 mph were reported. The strong winds produced widespread power outages.
San Luis Obispo County	3/04/2001 - 3/06/2001	Significant - Values Unknown	High Wind-A powerful and slow-moving storm brought heavy rain, strong winds and snow to Central and Southern California. Across SLO County, rainfall totals ranged from 2 to 6 inches over coastal/valley areas and 6 to 13 inches in the mountains producing extensive flooding. In Oceano, the Arroyo Grande



			Creek overflowed destroying numerous crops and damaging one home. In Arroyo Grande, flooding along Corbett Creek damaged four homes and five Arroyo Grande High School classrooms.
Oceano	2/02/2004	None	Tornado-A waterspout, developed offshore of the Oceano Dunes and came onshore as a weak tornado.
Cambria	01/02/2006	Significant – Values Unknown	Wind/Rain-Cambria experienced a significant wind and rain event which caused damage to over 60 homes and businesses. Several people were injured. First responders were unable to access many areas of Cambria due to downed power lines, utilities, tress and other debris. Several large areas of Cambria were without power for 5-9 days.
Halcyon	02/17/17	Significant Tree Damage	Wind storm resulted in the downing of 50 large eucalyptus, cypress and pine trees in the village of Halcyon.

Hazard Potential

These events can have significant impacts on the health and safety of the population and cause major property and infrastructure damage. Listed below are the primary dangers associated with these occurrences:

- Threat to life and danger to public health
- Damage/loss of personal property or crops and livestock
- Utility failures
- Interruption of the transportation network
- Interruption of communication systems

More specific impacts and effects for the various events are outlined below:



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Wind Storms and Thunderstorms

The typical wind in the planning area flows from the ocean in a northwest direction and will range from 10–25 MPH and is most prevalent in the spring. Winter storms, coming off the ocean, will generate higher wind speeds. The typical flow is from the south as the storm approaches, rotating to the north as the storm makes landfall. These winds are erratic; gusts of 35 MPH are common with rare gusts to 55 MPH being recorded. Large pressure gradient wind flows (i.e. Sundowner or Santa Anna winds) do occur in the planning area. An occasional offshore flow with wind speeds of 10-15 MPH will occur in the fall months.

Throughout the entire community, eucalyptus and cypress trees have been planted as wind breaks. There are no forested areas and naturally occurring trees are rarely found. Falling trees and branches can result in considerable property destruction, communication/power line damage, and block transportation corridors. This situation has recently been exacerbated by the disease/drought infested trees.

Occasionally, summer thunderstorms (lightning) will occur in the Santa Lucia Mountain range well to the north of the District. Thunder and lightning will be seen and heard in the distance. Rarely, wildfires in the mountains may be the result of these storms.

Coastal Erosion/Winter Storms

These storms may have hurricane-force winds and cause damage similar to that of a hurricane. However, they are not classified as such because they don't originate in the tropics. Coastal storms normally do most of their damage on the coast, in the form of beach erosion and flooding due to heavy rainfall. The winds originate from low-pressure systems offshore and circulate counterclockwise around the low pressure system. When the low pressure system stops moving, its winds combine with those of the high pressure system to blow in one direction over a long period of time, which may create massive waves. The duration of such a storm coupled with the height of the tide can be the most significant measure of its destructiveness.

As these storms move to the east, across the ocean front communities, they typically lose intensity as the coastal range behind Arroyo Grande causes the moist air to elevate, condense, and fall out. Arroyo Grande Creek, which flows through the community of Oceano, originates in this range and has caused significant flooding events to this area. High tides can further increase flooding potential.

The coastal areas of the south San Luis Obispo County, specifically Pismo Beach and the Oceano Dunes, are primarily characterized by wide sandy beaches backed by low bluffs in Pismo and tall sand dunes in Oceano. This section of coastline is subject to moderate to heavy wave action mostly from northerly swells, however the wide sandy beaches absorb and dissipate the wave energy with no history of significant coastal damage to the naturally occurring features. The Pismo Beach Pier, not a natural feature, has been damaged in past



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storms. Winter storm wave heights of 15-20 feet are routine with the very occasional wave height of 25 feet.

Hailstorms

Significant amounts of damage to property, notably to automobiles, skylights, and glass-roofed structures, can occur from hailstorms. The damage to landscape, vegetation and crops can also be severe. Fortunately, hail very rarely kills anyone. However, each year dozens of people are injured when they are unable to find adequate shelter. Hailstorms could occur anywhere within the District, however hailstorms of significance are very rare occurrences in the planning area. When they do occur, hail stones size is in the $\frac{1}{4}$ to $\frac{1}{2}$ inch range. Damage of consequence is not recorded.

Freeze and Heavy Snowfall

The proximity of the Pacific Ocean to the District moderates both the high and low temperatures in the area. Snowfall within the confines of the District does not occur. The average low temperature in January for Oceano is 43 degrees. On rare occasions (1-2 times/year), freezing temperatures may occur at night and in the early morning. Daytime temperatures below freezing do not occur. These "cold spells" typically last 2-3 days before temperatures return to normal. Damage to crops is very rare but when it occurs can be quite costly.

Extreme Heat

In the United States, heat waves are the most lethal type of weather phenomenon. Between 1992 and 2001, deaths from excessive heat in the United States numbered 2,190, compared with 880 deaths from floods and 150 from hurricanes. Situated on the coast, the community rarely experiences extremely high temperatures of long duration. However, the public health risks from extended exposure to higher than normal temperatures include hyperthermia, rashes, edema, dehydration, and heat cramps, to name a few.

The proximity of the Pacific Ocean to the District moderates both the high and low temperatures in the area. Sperling's comfort index for Oceano, California is an 84 out of 100, where a higher score indicates a more comfortable year-around climate. The U.S. average for the comfort index is 54. This index is based on the total number of days annually within the comfort range of 70-80 degrees, with a penalty applied for any days with excessive humidity. Oceano has approximately 185 sunny days each year with a July average high of 70 degrees. Temperatures in the 90 degree range are extremely rare and not previously recorded for the study area; therefore impacts from extreme heat are non-existent.



Relationships to Other Hazards-Cascading Events

Extreme Weather events can cause many cascading effects. Fire can break out as a result of damaged electrical equipment. Other problems and hazards associated with flooding and inclement weather include: utility disruptions, broken power lines lying on the ground, and communication system failures.

High winds often accompany winter storms and may cause significant damage to structures in the District by blowing down trees that have been killed or damaged by drought and disease or infestation. The eucalyptus and cypress trees found along Highway 1, the railroad right-of-way, and in scattered locations throughout the community present a moderate threat.

Plans and Programs in Place

The San Luis Obispo County Office of Emergency Services (OES) and the Five Cities Fire Authority, in coordination with local, state, and federal emergency response organizations, continually work to better prepare the residents for the impact of these types of emergency events.

First responder agencies, both law enforcement and fire, routinely train on handling the cascading effects that can result from events of this nature. The local chapter of the American Red Cross is prepared to assist citizens in shelter welfare issues.

The SLO Planning and Building Department stipulates and enforces codes and ordinances that ensure that buildings are constructed to prevent damage from extreme wind and weather events.

The National Weather Service uses a number of methods to get weather statements out to the general population. Examples include the Emergency Alert System, NOAA Weather Radio All Hazards (NWR), and newer smart phone Wireless Emergency Alerts (WEA). For certain significant adverse weather events, the County could potentially use the reverse 9-1-1 system. Early Warning System sirens are located throughout the Diablo Canyon Emergency Planning Zone Area.

Due to the unique and consistent weather patterns in the area, the National Weather Service (NWS) has broken the County into three weather forecast zones: San Luis Obispo County Central Coast, San Luis Obispo County Interior Valleys, and San Luis Obispo County Mountains. The NWS uses a multi-tier system of weather statements to notify the public of threatening weather conditions specific to these areas. These statements are used in conjunction with specific weather phenomena to convey different levels of risk. In order of increasing risk, these statements are:



Weather Related Terminology

- **Outlook** - A Hazardous Weather Outlook is issued daily to indicate that a hazardous weather or hydrologic event may occur in the next several days. The outlook will include information about potential severe thunderstorms, heavy rain or flooding, winter weather, extremes of heat or cold, etc., that may develop over the next seven days with an emphasis on the first 24 hours of the forecast. It is intended to provide information to those who need considerable lead time to prepare for the event.
- **Advisory** - An advisory is issued when a hazardous weather or hydrologic event is occurring, imminent, or likely. Advisories are for "less serious" conditions than warnings that may cause significant inconvenience, and if caution is not exercised could lead to situations that may threaten life or property. NWS may activate weather spotters in areas affected by advisories to help them better track and analyze the event.
- **Watch** - A watch is used when the risk of a hazardous weather or hydrologic event has increased significantly, but its occurrence, location, or timing is still uncertain. It is intended to provide enough lead time so those who need to set their plans in motion can do so. A watch means that hazardous weather is possible. People should have a plan of action in case a storm threatens and they should listen for later information and possible warnings especially when planning travel or outdoor activities. NWS may activate weather spotters in areas affected by watches to help them better track and analyze the event.
- **Warning** - A warning is issued when a hazardous weather or hydrologic event is occurring, imminent, or likely. A warning means weather conditions pose a threat to life or property. People in the path of the storm need to take protective action. NWS may activate weather spotters in areas affected by warnings to help them better track and analyze the event.
- **Statement** - A statement is either issued as a follow-up message to a warning, watch, or emergency, that may update, extend, or cancel the message it is following up or a notification of significant weather for which no type of advisory, watch, or warning exists.



Future Probability/Risk Assessment Conclusion

The planning area has a history of extreme weather, mostly winter storm related. These events can have significant impacts on the health and safety of the population and cause major property and infrastructure damage. These types of events include: winter storms, wind events, thunderstorms, and hailstorms. Given the wide range of exposure to a variety of extreme weather events, the significant past history indicates a high probability of these types of events reoccurring in the future. These events are typically short in duration.

Given the past history of both occurrence and damage, and based on the wide range of potential events, this section is rated as **Medium** in severity and **High** in probability.



VI. VULNERABILITY ASSESSMENT

A. DMA 2000 Requirements

DMA Requirement §201.6(c)(2)(ii):	The risk assessment shall include a description of the jurisdiction's vulnerability to the hazards described in paragraph (c)(2)(i) of this section. This description shall include an overall summary of each hazard and its impact on the community.
DMA Requirement §201.6(c)(2)(ii)(A):	The plan should describe vulnerability in terms of the types and numbers of existing and future buildings, infrastructure, and critical facilities located in the identified hazard areas.
DMA Requirement §201.6(c)(2)(ii)(B):	The plan should describe vulnerability in terms of an estimate of the potential dollar losses to vulnerable structures identified in paragraph (c)(2)(i)(A) of this section and a description of the methodology used to prepare the estimate.
DMA Requirement §201.6(c)(2)(ii)(C):	[The plan should describe vulnerability in terms of] providing a general description of land uses and development trends within the community so that mitigation options can be considered in future land decisions.
DMA Requirement §201.6(c)(2)(iii):	For multi-jurisdictional plans, the risk assessment must assess each jurisdiction's risks where they vary from the risks facing the entire planning area.

B. Summary of Community's Vulnerability

As outlined above, given the past history, the current conditions, and the overall life and property threat to the District, the Hazard Mitigation Planning Group has deemed the probability and severity of each hazard as follows:



Oceano Community Services District	Earth-quake	Extreme Weather	Drought	Flood	Tsunami
Probability	H	H	H	H	L
Severity	H	M	L	M	M

L = Low, M= Medium, H = High

The vulnerability assessment is a summary of the hazard's impact to the community's vulnerable structures. Community assets and development trends will be identified and assessed with respect to the developed hazard profiles to ascertain the potential amount of damage that could ensue from each identified hazard. This section will include: 1) A description of the critical buildings and infrastructure within the study areas including future building and land use decisions. 2) A general description of the extent of each hazard's impacts to these vulnerable structures, 3) An estimate of the potential dollar losses to vulnerable structures, and 4) Vulnerable populations within the jurisdiction.

C. Critical Facilities and Infrastructure

Critical facilities and infrastructure are those systems within each community whose incapacity or destruction would have a debilitating effect on the community's ability to recover subsequent to a major disaster. The following critical facility and infrastructure are categorized as follows:

1. **Emergency Services** for the health and welfare of the whole population (e.g., hospitals, police, fire stations, emergency operations centers, evacuation shelters, schools).
2. **Lifeline Utility Systems** such as potable water, wastewater, oil, natural gas, electric power and communications systems.
3. **Transportation Systems** including railways, highways, waterways, airways and city streets to enable effective movement of services, goods and people.
4. **High Potential Loss Facilities** such as power plants, dams and levees.



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Non-Critical Facilities

For the purpose of this plan, properties such as recreational facilities, parks, libraries, religious facilities, and historical buildings will be classified as non-critical facilities. Although their relevance to the District and its residents is undeniably significant, they are not classified as 'critical facilities' per the definition set in Executive Order 13010 (Critical Infrastructure Protection 1996).

Residential Facilities

Although personal residences are not by the above definition considered to be critical facilities, their relevance to these communities and its citizens is unquestionable. For that reason, they have been included in the District's vulnerability assessment.

Vulnerable Populations

Vulnerable populations reside within the Oceano Community Services District including the elderly, physically and mentally disabled, homeless, carless, and limited English speakers. Given the District's close proximity to the Diablo Canyon Nuclear Power Plant, a detailed special needs population list/inventory is completed each year and is immediately available to all first responders. A number of non-profit organizations and services assist these populations on a daily basis. Specific examples include Meals on Wheels, Five Cities Homeless Coalition, and the Oceano Boys & Girls Club. The county has a well-organized VOAD group which will act as an advocate for these vulnerable individuals during an emergency within the District.

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D. Jurisdictional Assets at Risk to Applicable Hazard

Assets at risk include: Buildings, Critical Facilities, Infrastructure, Private Property and Areas (Residential, Environmental, Historical and Economic)

Critical Facilities and Infrastructure	Oceano Address	Building and Content Value	Earthquake	Extreme Weather	Tsunami	Drought	Flood
Administration Building	1655 Front Street	\$500,000/300,00	X	X			
Sheriff Sub Station	1681 Front Street	\$1,500,000/1,000,000	X	X			
Fire Station	1655 Front Street	\$500,000/150,000	X	X			
Chlorinator Shed	1687 Front Street	\$5,000	X	X			
Warehouse	1935 Wilmar Street	\$200,000/90,000	X	X			
Shop/Field Office	1935 Wilmar Street	\$125,000/100,000	X	X			
Water Tank (Large)	1935 Wilmar Street	\$1,000,000	X				
Water Tank (Small)	1935 Wilmar Street	\$300,000	X				
Well # 4 (350 Feet)	1981 Wilmar Street	\$275,000				X	
Well # 6 (620 Feet)	1981 Wilmar Street	\$350,000				X	
Well # 7 (175 Feet)	1687 Front Street	\$200,000			X	X	X
Well # 8 (525 Feet)	1650 Front Street	\$250,000			X	X	X
Sewer Booster Station	1935 Wilmar Street	\$100,000	X				
Sewer Lift Station	555 Pier Street	\$400,000	X		X		X
Surge Tank	1935 Wilmar Street	\$15,000	X				

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23 Miles Water Service Lines	District	\$3,800,000	X				
18 Miles Wastewater Lines	District	\$2,000,000	X				
260 Fire Hydrants	District	\$1,300,000	X				
Residential Facilities: Approximately 3500 Housing Units	District	\$1,774,500 (\$338/sq. ft x average 1500 sq.ft.)	X	X		X	
Total Values		\$16,234,500					

E. Methodology Used

To determine the number of critical structures and infrastructure at risk, a combination of field surveys, aerial photos, GIS maps, and Google Earth software was used. The methodology used in preparing the Vulnerability Estimate consisted of determining the value of critical buildings and facilities from insurance property schedules. Critical infrastructure values were established by using actual replacement costs which were determined by recent comparable replacement projects.

F. Loss Estimations

Dollar losses to buildings and infrastructure vary depending upon the natural hazard occurring and the severity of the hazard. In general, earthquakes can extensively damage a wide area therefore critical structure and infrastructure losses should be estimated at a 100% value. Destruction from flooding takes place in specific areas and the damage is historically less severe than that of an earthquake. Thus, the estimated loss as a result of flooding should be calculated at the 50% level. Damage resulting from tsunamis should be calculated at 100% of structural value for those properties located within inundation areas. Extreme weather could impact any portion of the jurisdiction. Historical data indicates that these events are extremely localized and a 10% loss of the value of the structure damaged should be anticipated.

G. Development Trend Analysis

While the population of both San Luis Obispo County and the District is expected to grow moderately in the next five years, there are Land Use policies and elements within the County General Plan to help assure orderly development.



In addition, the Local Agency Formation Commission (LAFCO) is tasked with the mission to provide an orderly pattern of growth that reconciles the varied needs of the County. One of the fundamental principles of LAFCO is to ensure the establishment of an appropriate and logical municipal government structure for the distribution of efficient and appropriate public services. LAFCO Land Use objectives include:

- The discouragement of urban sprawl
- Preservation of the physical and economic integrity of agricultural lands
- Preservation of open space within urban development patterns
- Orderly formation and development of agencies by shaping local agency boundaries
- The minimization of agencies providing services to a given area
- Utilization of Spheres of Influence to guide future development of agency boundaries

All building and development activities occurring within the District are guided and permitted through the SLO County Planning Department with advice from the Oceano Advisory Committee. The District has no authority over planning and development, however the Oceano Advisory Committee (OAC) regularly meets and reports to the County Planning Commission on matters of planning and building for the community of Oceano exclusively. The entire area of the District, with the exception of creeks, small lakes and marshes, is developed in one form or another. Residential in-fill projects will continue to occur throughout the District and will consist primarily of planned single unit developments and a limited number of multi-family residential projects. Commercial development will also consist of infill or the redevelopment of existing parcels.

There are three sizable portions of land that are in high value agricultural production found within the District. Two are located within the Halcyon Historical District (Pike/Elm and S. Halcyon/Highway 1 areas) and are owned by the Temple of the People Theosophical religious group. These three large parcels could potentially be converted to commercial or residential use. However, they have a very high quality soil and are valued for their agricultural profitability. The two parcels found within the Halcyon Historical District would face even stricter land use planning scrutiny.

The District and the Five Cities Fire Authority have the capability to serve the needs of future development as it occurs.



VII. CAPABILITY ASSESSMENT

A. Overview

In developing the Capability Assessment, it is important to remember that a number of agencies will be involved in carrying out the identified mitigation measures. An important component of the mitigation strategy is an understanding of the resources available to the County, the District, and the Five Cities Fire Authority in order to mitigate the effects of each of the identified hazards. The Capability Assessment begins with a review of legal and regulatory capabilities, including ordinances, codes, and plans used to facilitate hazard mitigation activities. This assessment also describes the administrative and technical capability available to the jurisdictions. The third component of the Capability Assessment is each agency's ability to manage the funding required to implement mitigation strategies. This is followed by a discussion of the community's general willingness to implement mitigation measures. The final part of the Capability Assessment is a review of the physical assets available to respond to the emergency needs of the community.

B. Legal and Regulatory

California Special Districts are state agencies created for the local performance of a specific governmental or proprietary function, unlike cities and counties that perform a wide variety of functions for their citizenry. Special districts provide services and facilities within a defined boundary and are governed by a board.

The County and the District have the applicable building codes, zoning ordinances, subdivision regulations, Capital Improvement Plans, and other regulatory development guidelines which enable it to implement hazard mitigation activities and prevent repetitive losses within the District. The County of San Luis Obispo is a participant in the National Flood Insurance Program (NFIP). The NFIP delineates flood areas (100 and 500 year maps) and outlines how and where structures may be built in those areas.

California state law requires each city and county to adopt a general plan "for the physical development of the county or city, and any land outside its boundaries which bears relation to its planning" (Section 65300 of the California Government Code).

General plans in California are required to have seven mandatory elements, and the SLO County General Plan includes those seven plus several other optional elements for a total of eleven including: Land Use Coastal, Land Use Inland, Circulation, Housing, Conservation and Open Space, Noise, Safety, Parks and Recreation, Economic Development, Agricultural, and Off-Shore Energy.



Legal Authority

Local governments in California have a wide range of tools available to them for implementing mitigation programs, policies and actions. A hazard mitigation program can utilize any or all of the government powers granted by the State of California, which include:

- **General Police Power**

The general police power of the County is typically enacted and enforced with ordinances which define, prohibit, regulate or abate acts, omissions, or conditions detrimental to the health, safety, and welfare of the people, and to define and abate nuisances, including public health nuisances.

Since hazard mitigation can be included under the police power as protection of public health, safety and welfare, towns, cities and counties may include requirements for hazard mitigation in local ordinances. Local governments may also use their ordinance making power to abate “nuisances,” which could include any activity or condition making people or property more vulnerable to a hazard.

- **Building Codes and Inspection**

Construction within the County must meet the standards of the California Building Code. The County’s Planning and Building Department reviews proposed subdivisions and building plans, and conducts site inspections to ensure applicable codes are followed. Additionally, the FCFA reviews projects for enforcement of the California Fire Code.

- **Land Use Regulations**

Land use regulatory powers include planning, enacting and enforcing zoning ordinances, floodplain ordinances, and land division controls. San Luis Obispo County government controls the amount, timing, density, quality and location of new development in order to reduce a community’s vulnerability to naturally occurring hazards. Thus, unsafe development in hazard prone areas can be prevented through local planning, zoning and development review by the Planning and Building Department.

- **Acquisition/Eminent Domain**

California legislation empowers cities, towns and counties to acquire property for public purpose by gift, grant, devise, bequest, exchange, purchase, lease or eminent domain. The County can and has used acquisition as a tool for pursuing local mitigation goals. This reduces or eliminates the possibility of unsafe development occurring.



- **Taxation**

California law gives local government the power to levy taxes and special assessments. The power of taxation extends beyond merely the collection of revenue, and can have a profound impact on the pattern of development in the community. California does not allow cities or counties to increase tax rates beyond the base rate, except with voter approval. A community can pursue voter approval of a bond or similar mechanism to increase the property tax to be used for a specific purpose. Often used for schools, the increase could be used for a fuel break program or other hazard reduction program. While voter approval of such measures is difficult to obtain it is not impossible.

- **Spending/Budget**

Local governments have the power to make expenditures in the public interest. Hazard mitigation principles can be made a routine part of all spending decisions made by the local government, including the adoption of budgets and a Capital Improvement Plan (CIP).

A CIP is a schedule for the provision of municipal or county services over a specified period of time. Capital programming, by itself, can be used as a growth management technique, with a view to hazard mitigation. By tentatively committing itself to a timetable for the provision of capital to extend services, a community can control growth to some extent, especially in areas where the provision of on-site sewage disposal and water supply are unusually expensive.

In addition to formulating a timetable for the provision of services, a local community can regulate the extension of and access to services. A CIP that is coordinated with extension and access policies can provide a significant degree of control over the location and timing of growth. These tools can also influence the cost of growth. If the CIP is effective in directing growth away from environmentally sensitive or high hazard areas, for example, it can reduce environmental costs.

C. Administrative and Technical

Both the County and the Oceano Community Services District have experienced and competent administrative and technical staff in place to expedite the mitigation actions identified. They possess technical expertise in the areas of planning, engineering, floodplain management, Geographic Information Systems (GIS), and both emergency and general management authority. Additionally, professional contractors with technical and administrative resources are available to assist the staff in implementing the hazard mitigation goals.



D. Financial

In order to achieve the goals and objectives of the Mitigation Strategy, one or more of the following funding sources will be utilized: federal and state entitlements and grants, general fund, sales and property taxes, infrastructure user fees, impact fees, and new development impact fees. All the agencies involved have the necessary budgetary tools and practices in place to facilitate handling appropriate funds. However, local funding sources are currently very limited.

E. Political Will of Community

The Oceano community is comprised of residents, business owners and other key stakeholders with a vested interest in making their community safer from natural hazards. Local residents are knowledgeable about the natural hazards that have impacted their community in the past and are familiar with the natural hazards that could potentially impact their community and the concept of mitigation. For this reason, the community fully supports hazard mitigation strategies and is open to implementing changes that will make this district and its residents safer.

F. Physical Assets

Water and Wastewater

Readily available physical resources from the District's Water and Wastewater Departments include the following:

- 1 Vactor/Pump Unit
- 1 Ford F-550 Dump Truck
- 1 Ford F-150 Pickup Truck
- 2 Chevy 2500 Utility Trucks w/cranes
- 1 John Deere Tractor
- 1 John Deere Backhoe
- 1 Ingersoll-Rand Compressor
- 1 MQ Power Generator



Fire Service

Fire protection and emergency medical services are provided by the Five Cities Fire Authority, which is comprised of the Oceano CSD, and the Cities of Arroyo Grande, and Grover Beach. The population served is approximately 37,000 people over a 10 square mile area. There are three fire stations, with one located at 1655 Front Street in Oceano. The FCFA responded to 3,838 calls for service in 2017 with an average response time of six minutes.

Apparatus:

- Type I (Structural) Engines: 4
- Type II USAR/BSU: 1
- Type III (Wildland) Engines: 1
- Staff/Fleet Vehicles: 3
- Truck (100' Platform): 1
- Command Vehicles: 3
- Type VI Patrol: 1
- State OES Engine: 1

G. Ability to Expand/Implement Mitigation Strategies

The OCSD has very limited capability to improve existing policies and programs as a result of the small size of the jurisdiction along with budgetary constraints. These financial limitations will also prevent increasing current staffing levels and purchasing additional resources. That said, given the District's emphasis on protecting its small community, resources have been set aside as described below for the implementation of designated mitigation actions.



VIII. MITIGATION STRATEGY

A. DMA 2000 Requirements

DMA Requirement §201.6(c)(3)(i):	The hazard mitigation strategy shall include a description of mitigation goals to reduce or avoid long-term vulnerabilities to the identified hazards.
DMA Requirement §201.6(c)(3)(ii):	The mitigation strategy shall include a section that identifies and analyzes a comprehensive range of specific mitigation actions and projects being considered to reduce the effects of each hazard, with particular emphasis on new and existing buildings and infrastructure.

B. 2019 Goals, Objectives and Mitigation Actions for Oceano Community Services District

Goal 1	Promote understanding and support for hazard mitigation by key stakeholders and the public within the Community of Oceano.
Objective 1	Educate key stakeholders and the public to increase awareness of hazards including earthquake, wind, winter storms, hail, freeze, heat, drought, tsunami and flood events and opportunities for mitigating hazards.
Mitigation Action 1.A	Through newsletters, speaking engagements and other public contacts, continue to educate the general public and key stakeholders on the District's issues, responsibilities, and current efforts and successes in the area of disaster preparedness.
Mitigation Action 1.B	Utilize the District's website to inform the public of hazard mitigation efforts, disaster preparedness messages, and emergency situation information.



Goal 2	Ensure that future development is protected from natural disasters including earthquakes, wind, winter storms, hail, freeze, heat, drought, tsunamis and flooding.
Objective 2	Work with County Planning staff to limit new development in hazardous areas. Build to standards that will prevent or reduce damage from naturally occurring events.
Mitigation Action 2.A	Educate the Oceano Advisory Committee (OAC) members and elected OCSD BOD members on the importance of keeping current on trends and developments in disaster preparedness.
Mitigation Action 2.B	Encourage OAC members to attend local seminars and lectures on naturally occurring hazards so that they may better understand and assist County Planning staff as they process future development.
Mitigation Action 2.C	In order to better protect life and property, continue to accumulate from the county accurate and comprehensive series of maps and data sets that pertain to the District's earthquake, tsunami and flood threats.
Goal 3	Build and support local capacity and commitment to minimize the District's vulnerability to potential naturally occurring hazards.
Objective 3.1	Improve existing capabilities of the OCSD staff to manage emergency situations.
Objective 3.2	Enhance the safety of OCSD residents and staff.
Objective 3.3	Improve the District's communication systems so that in the event of a major emergency it will continue to operate effectively (redundancy and standby power).
Objective 3.4	Improve the District's auxiliary power systems so that in the event of a major power failure all systems will continue to operate effectively (redundancy and standby power).

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Mitigation Action 3.1A	Develop a Continuity of Operations Plan (COOP) for the District and train all essential staff on their roles and responsibilities as delineated in the Plan.
Mitigation Action 3.1B	Update the existing Emergency Operations Plans and supporting documents to ensure coordination with the County Emergency Operations Center (EOC), Emergency Response Plans and SOP's.
Mitigation Action 3.1C	Train all District department managers and key staff members on their roles and responsibilities in emergency management and the District DOC as outlined in independent study courses FEMA/National Incident Management System - ICS 100, 700, and 800.
Mitigation Action 3.1D	Working with SLO County OES, increase participation by District staff members in disaster drills put on by the County.
Mitigation Action 3.1E	Send one District management employee to the California Specialized Training Institute (CSTI) Public Information Officer Course.
Mitigation Action 3.1F	Support the efforts of the FCFA in the implementation of the Five Year Strategic Plan.
Mitigation Action 3.2A	In order to ensure that employees are available to assist during a major emergency, have all OCSD departments adopt a Family Support Plan. (Note: A model plan is available through SLO County OES.)
Mitigation Action 3.2B	Make improvements to wastewater collection systems by replacing or relining collection pipes so as to reduce sewer overflows and limit inflow and infiltration subsequently reducing the public health threat.
Mitigation Action 3.2C	Train staff on the proper techniques for containing sewer system overflows (SSO Protocols).



Mitigation Action 3.3A	Work with the South County ARES/RACES group in developing a Communications Master Plan for re-establishing District's radio communications systems.
Mitigation Action 3.3B	Utilize the South County ARES/RACES group expertise, obtain and install a base station radio, mobile radios, and a standby power source to facilitate communications throughout the District as outlined in the Communications Master Plan.
Mitigation Action 3.4A	Develop a plan to provide standby power to the following essential service systems/functions: water well #8, the Administration Building, and the Sheriff's Substation.
Mitigation Action 3.4B	Collaborate with the Sheriff's office on funding sources for a standby power system for the substation and the administration building.
Mitigation Action 3.4C	Work with PG&E and County OES to explore potential funding sources for an auxiliary power source for water well # 8.
Goal 4	Minimize the level of damage and losses to people, existing and future critical facilities and infrastructure due to flooding.
Objective 4.1	Enhance the ability of community assets, particularly critical facilities, located in the 100-year floodplain to handle existing and projected flood levels.
Mitigation Action 4.1A	Support the efforts of the county in maintaining compliance with the National Flood Insurance Program (NFIP) requirements.
Mitigation Action 4.1B	Through the Development Review process (OAC), ensure the County restricts construction of essential service facilities in the 100-year flood plain.
Mitigation Action 4.1C	Continue to work cooperatively with the county, state, and federal flood related agencies for funding improvements through grant and agency programs.



Mitigation Action 4.1D	Support the County's efforts to improve the drainage from the Front Street/Hwy. 1 flooding areas through a combination of vegetation management and storm drain improvements along Hwy. 1, moving the water to the Arroyo Grande Creek.
Mitigation Action 4.1E	Relocate the District's water and sewer lines that will be impacted by the Front Street/Hwy. 1 storm drain project.
Mitigation Action 4.1F	Support the efforts of the County and the Flood Control District in upgrading the Arroyo Grande Creek levee on both the north and south sides through a combination of vegetation and sediment management and raising both the north and south sides of the levee in a number of places.
Goal 5	Minimize the level of damage and losses to people, existing and future critical facilities and infrastructure due to earthquakes.
Objective 5.1	Continue public education efforts so as to better prepare the citizens of the District from the effects of a significant earthquake event.
Objective 5.2	Enhance the ability of community assets, particularly critical facilities, to survive the impacts of a significant earthquake.
Objective 5.3	Enhance the ability of OCSD administration and FCFA first responders to manage the impacts of a significant earthquake.
Mitigation Action 5.1	Working with SLO County OES, increase the public's awareness and participation in earthquake preparedness activities such as the annual Great California Shake-Out drill.
Mitigation Action 5.2A	Continue replacing the water lines that are most vulnerable to an earthquake as delineated in the Cannon study.
Mitigation Action 5.2B	As delineated in the RRM Facilities Study, develop a replacement schedule for buildings found to be vulnerable to an earthquake.



Mitigation Action 5.3A	Support the FCFA efforts to train fire department staff in the California State Fire Marshal's Rescue System 1 and 2 programs.
Mitigation Action 5.3B	Send one District management employee to the California Specialized Training Institute (CSTI) Introduction to Earthquake Management Course.
Goal 6	Limit risk to, and impacts from hazardous materials spills, sewage spills, intentional discharges, illegal disposals, transportation accidents, or system failures.
Objective 6.1	Support the efforts of the county in the continuing efforts to manage the use, sale, distribution and disposal of hazardous materials in the District.
Objective 6.2	Improve emergency response efforts in the control and clean-up of accidental spills and releases of both hazardous materials and sewage spills.
Mitigation Action 6.1A	Educate community members on the impacts associated with disposing of household hazardous materials on the wastewater system and provide advice on proper storage and disposal techniques.
Mitigation Action 6.1B	Continue efforts to educate applicable employees on the handling, use, storage and disposal of hazardous materials utilized in the workplace.
Mitigation Action 6.2	Support the FCFA in training 2 first responders to the Hazardous Materials Technician Level (CSTI)
Goal 7	Minimize the level of damage and losses to people, existing and future critical facilities and infrastructure due to a tsunami event.
Objective 7.1	Assist County OES in continuing their public education efforts to better prepare the citizens and visitors of the District from the effects of a significant tsunami event.
Objective 7.2	Enhance the ability of community assets, particularly critical facilities, to survive the impacts of a significant tsunami event.

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Mitigation Action 7.1	Continue working with County OES in the distribution of the existing tsunami public education pamphlet/map to the visitors and residents in the Tsunami inundation zone.
Mitigation Action 7.2	Work with County OES and the California Coastal Commission to post evacuation route signage along Pier Street, and in the Airport and Oceano Campground areas.

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C. How Mitigation Goals Address Existing and New Buildings and Infrastructure

The following tables demonstrate how the proposed mitigation actions take into account both existing and future buildings and infrastructure.

Existing Buildings and Infrastructure:

MITIGATION GOALS	EXISTING BUILDINGS AND INFRASTRUCTURE					
	Electrical and Power Infrastructure	Water and Wastewater Management	Communication Facilities	Critical Roads and Bridges	Essential Service Facilities	Public Structures
Goal 1-General Mitigation: Promote understanding of hazard mitigation	X	X	X	X	X	X
Goal 2-General Mitigation: Protect future development.	X	X	X	X	X	X
Goal 3-General Mitigation: Build local capacity and commitment.	X	X	X	X	X	X
Goal 4-Flood: Minimize damage due to flooding.	X	X		X	X	X
Goal 5-Earthquake: Minimize the level of damage and losses to due to geological events.	X	X	X	X	X	X

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Goal 6 – Hazardous Materials: Limit risk from hazardous materials spills.		X				
Goal 7- Tsunami: Minimize damage and loss of life from a tsunami event.	X	X		X	X	X

Future Buildings and Infrastructure:

MITIGATION GOALS	FUTURE PROJECTS / BUILDINGS AND INFRASTRUCTURE					
	Residential Subdivisions	Various mixed use projects (residential and commercial)	Ag Clusters (residential, open space, and Ag uses)	Commercial and Industrial Projects	Essential Service Facilities	Public Structures
Goal 1-General Mitigation: Promote understanding of hazard mitigation	X	X	X	X	X	X
Goal 2-General Mitigation: Protect future development.	X	X	X	X	X	X

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Goal 3-General Mitigation: Build local capacity and commitment.	X	X	X	X	X	X
Goal 4-Flood: Minimize damage due to flooding.	X	X	X	X	X	X
Goal 5-Earthquake: Minimize the level of damage and losses to due to geological events.	X	X	X	X	X	X
Goal 6 –Hazardous Materials: Limit risk from hazardous materials spills.	X	X	X	X	X	X
Goal 7-Tsunami: Minimize damage and loss of life from a tsunami event.	X	X	X	X	X	X



IX. MITIGATION ACTION IMPLEMENTATION

A. DMA 2000 Requirements

DMA Requirement §201.6(c)(3)(iii):	The mitigation strategy section shall include an action plan describing how the actions identified in section (c)(3)(ii) will be prioritized, implemented, and administered by the local jurisdiction. Prioritization shall include a special emphasis on the extent to which benefits are maximized according to a cost benefit review of the proposed projects and their associated costs.
DMA Requirement §201.6(c)(3)(iv):	For multi-jurisdictional plans, there must be identifiable action items specific to the jurisdiction requesting FEMA approval or credit of the plan.
DMA Requirement §201.6(c)(4)(i):	The plan maintenance process shall include a section describing the method and schedule of monitoring, evaluating, and updating the mitigation plan within a five-year cycle.
DMA Requirement §201.6(c)(4)(ii):	The plan shall include a process by which local governments incorporate the requirements of the mitigation plan into other planning mechanisms such as comprehensive or capital improvement plans, when appropriate.
DMA Requirement §201.6(c)(4)(iii):	The plan maintenance process shall include a discussion on how the community will continue public participation in the plan maintenance process.

B. Prioritization of Mitigation Actions

Each mitigation action was prioritized based on:

- The probability of the threat occurring
- The effectiveness of the mitigation action. To determine this, the contractors examined each mitigation action's effectiveness in protecting lives, preventing injury, preserving property, eliminating or reducing damage to critical facilities, residences and infrastructure.



- The practicality of carrying out the mitigation action within the jurisdiction. To determine this, the following factors were considered: technical and administrative capabilities, financial resources, environmental impact, the impact on the District, social acceptance, political support, and mitigation strategies that reflect community objectives.

This gave rise to the development of an overall relative risk value that resulted in ratings of **HIGH**, **MEDIUM** and **LOW** for each of the mitigation actions. The resultant prioritization was presented to key stakeholders and lengthy discussions were held to ensure that the results were indeed applicable to the priorities and capabilities of the District.

Mitigation Action Prioritization Worksheet

Mitigation Action	Hazard Risk Minimal=1 Moderate=2 High=3	Mitigation Action Effectiveness Minimal=1 Moderate=2 High=3	Mitigation Action Practicality Minimal=1 Moderate=2 High=3	Cost Benefit Analysis Minimal=1 Moderate=2 High=3	Total	Overall Ranking
1.A	2	3	2	2	9	Medium
1.B	2	3	2	2	9	Medium
2.A	2	3	2	2	9	Medium
2.B	2	3	2	2	9	Medium
2.C	1	1	2	2	6	Low
3.1A	2	3	3	3	11	High
3.1B	2	3	3	3	11	High
3.1C	2	2	2	3	9	Medium
3.1D	2	3	2	3	10	High
3.1E	2	2	3	3	10	High
3.1F	3	2	2	2	9	Medium
3.2A	1	1	2	2	6	Low
3.2B	2	3	3	2	10	High

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3.2C	2	3	3	2	10	Medium
3.3A	1	1	2	2	6	Low
3.3B	1	2	2	2	7	Medium
3.4A	2	2	2	2	8	Medium
3.4B	3	2	2	2	9	Medium
3.4C	3	2	2	2	9	Medium
4.1A	1	1	1	2	5	Low
4.1B	2	2	1	2	6	Low
4.1C	2	3	3	3	11	High
4.1D	3	3	2	3	11	High
4.1E	3	3	3	2	11	High
4.1F	2	3	2	3	10	High
5.1	2	2	3	2	9	Medium
5.2A	2	3	3	2	10	High
5.2B	3	2	3	3	10	High
5.3A	1	2	2	1	6	Low
5.3B	2	2	3	3	10	Medium
6.1A	1	2	2	1	6	Low
6.1B	2	2	3	3	10	Medium
6.2	1	1	2	1	5	Low
7.1	1	2	2	3	8	Medium
7.2	1	2	1	2	5	Low

Priority Ranking Values:

4 – 6 = Low

7 – 9 = Medium

10 – 12 = High



C. Action Plan

The following Action Plan was presented to the District, the Hazard Mitigation Planning Group, the general public and the OCSD Board of Directors. The Action Plan delineates what agency is responsible for carrying out each mitigation action, how it will be funded and a target completion date to ensure that the newly constructed plan is implemented and remains an active and relevant document. Actual implementation may be dependent upon funding availability.

ACTION PLAN FOR 2019 MITIGATION ACTIONS

MITIGATION ACTION		IMPLEMENTATION STRATEGY			
ID	DESCRIPTION	RESPONSIBLE DEPARTMENT	FUNDING SOURCES	COMPLETION DATE	PRIORITY
1.A	Educate public and Stakeholders about opportunities for mitigating hazards	ALL (All indicates all OCSD Board Members and Staff)	Administration and General Fund	Ongoing	Medium
1.B	Educate staff on current disaster preparedness developments	ALL	Administration and General Fund	Ongoing	Medium
2.A	Educate OAC and OCSD-BOD on trends and developments	Administration, Oceano Advisory Committee, and Board of Directors	Administration and General Fund	Ongoing	Medium
2.B	Educate OAC on hazard profiles and development review process	Administration, Oceano Advisory Committee, and Board of Directors	None Required	Ongoing	Medium
2.C	Compile Maps/Data Sets on Hazards	Utility Systems Supervisor	None Required	01/01/2019	Low

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3.1A	Continuity of Operations Plan	OCSD Administration	None Required	07/01/2019	High
3.1B	Update Emergency Plan	Utility Systems Supervisor	None Required	07/01/2019	High
3.1C	Training – NIMS and ICS	ALL	None Required	Yearly	Medium
3.1D	Attend Disaster Drills	ALL	None Required	Yearly	High
3.1E	PIO Training (CSTI)	Administration	Grant	07/01/20	High
3.1F	FCFA 5 year Strategic Plan	OCSD BOD and Administration	None Required	Ongoing	Medium
3.2A	Family Support Plan	OCSD Administration	None Required	07/01/2019	Low
3.2B	Wastewater Pipe Repair	Utility Systems Supervisor	Sewer Fund	Ongoing	High
3.2C	Train Staff – SSO Protocols	Utility Systems Supervisor	Sewer Fund	Ongoing	Medium
3.3A	Communications Master Plan	OCSD Admin.	None Required	09/01/2019	Low
3.3B	Radio System Improvements	OCSD Admin.	None Required / Equipment Fund	09/01/2020	Medium
3.4A	Study Standby Power Systems	OCSD Admin.	None Required	10/01/2019	Medium
3.4B	Power Sheriff/Admin Building	OCSD Admin.	Grant/General Fund	10/01/2021	Medium
3.4C	Power Well # 8	Utility Systems Supervisor	Grant/Water Fund	10/01/2020	Medium

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4.1A	National Flood Insurance Program	SLO County Planning Staff and OCSD admin.	None Required	Ongoing	Low
4.1B	Flood Zone Development Restrictions	OCSD Administration, Oceano Advisory Committee, and Board of Directors	None Required	Ongoing	Low
4.1C	Funding Flood Improvements	SLO County Public Works Staff	Grants and Flood Control District Funds	Ongoing	High
4.1D	Hwy. 1 Flood Project	SLO County Public Works Staff	None Required	Ongoing	High
4.1E	Hwy. 1 Infrastructure-Utility Relocation	OCSD BOD, Admin and Utility Systems Supervisor	Water/Sewer Funds	07/01/2019	High
4.1F	Levee Maintenance	SLO County Public Works	Grants and Flood Control District Funds	04/01/2019	High
5.1	Earthquake Drill	ALL	None Required	04/01/2020	Medium
5.2A	Pipe Repair/Replace	OCSD Admin and Utility Systems Supervisor	Water/Wastewater funds/Grants and loans	Ongoing	High
5.2B	Facilities Replacement	OCSD Admin and Utility Systems Supervisor	Water/Wastewater funds/Grants and loans	Ongoing	High
5.3A	FCFA Rescue Training	Five Cities Fire Authority/Board of Directors	None Required	Yearly	Low

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5.3B	Earthquake Management (CSTI)	All	Grant/General Fund	Yearly	Medium
6.1A	Educate – Hazardous Materials	Five Cities Fire Authority/OCSD Board of Directors	None Required	07/01/2019	Low
6.1B	Hazardous Materials Handling	Water and Wastewater Staff	None Required	01/01/2019	Medium
6.2	FCFA Hazardous Materials Training	Five Cities Fire Authority and OCSD Board of Directors	None Required	Yearly	Low
7.1	Educate -Tsunami Plan	OCSD Admin.	None Required	Ongoing	Medium
7.2	Evacuation Route	OCSD Admin.	None Required	07/01/2020	Low

D. Implementation Through Existing Plans and Programs

The Oceano Community Services District adheres to comprehensive land use planning and building codes provided by San Luis Obispo County Planning Department to guide and control development within the District. This Hazard Mitigation Plan will be made available to all those responsible for the County's General Plan development mechanisms to ensure that consistency is maintained. The Oceano Advisory Committee reports directly to the County Planning Department on matters relating to building and development. Both the Oceano Advisory Committee and County Planning Department members were involved in the construction of this plan.

The District has a number of policies and procedures, purchasing guidelines, and capital improvement procedures currently in place. The Mitigation Actions outlined in this Plan will be incorporated into those documents under the direction of the OCSD General Manager.

Mitigation Actions have been assigned to a number of specific individuals, departments and County jurisdictions. These individual actions will fall under the general administrative oversight of the governing body. Should technical expertise not be available to these individuals or departments, the County Office of Emergency Services is committed to, when possible, coordinating the resources of the County to assist with implementation of the



mitigation actions within the jurisdiction. The general administrative oversight of this Hazard Mitigation Plan rests with the Oceano Community Services District General Manager.

E. Continued Public Involvement

DMA Requirement §201.6(d)(3): A local jurisdiction must review and revise its plan to reflect changes in development, progress in local mitigation efforts, and changes in priorities, and resubmit if for approval within 5 years in order to continue to be eligible for mitigation project grant funding.

The Oceano Community Services District recognizes the importance of involving the public in the ongoing Hazard Mitigation Plan review and updating process. Resultantly, the following actions have been taken:

- The District website has been posting the plan and updating the postings as changes are implemented. Their website has let the public know that the Plan is available for general public viewing and comment.
- A hard copy is available at the OCSD office for public viewing as requested.

F. Plan Monitoring, Evaluating and Updating

The mitigation plan must reflect current conditions in order to continue to be an effective representation of the Oceano Community Services District's overall strategy for reducing its risks from natural hazards. Monitoring and evaluating the plan will occur annually during the District's yearly budget review process each Spring to make certain that the goals and objectives for the community are current and mitigation activities are being budgeted and fully implemented.

To ensure that regular review and update of this Hazard Mitigation Plan occurs on an annual basis, the following actions will be taken:

- The Oceano Community Services District General Manager will in his annual report to the OCSD Board of Directors (CCSD), include an update on the goals and objectives of the plan.
- Following input from board members, the OCSD General Manager will communicate his findings to the Hazard Mitigation Planning Group. In this manner,



the Board, the General Manager, and Planning Group members can ensure that the plan components are up-to-date and meet current realities.

The Planning Group will provide the foundation for ongoing mitigation within the community through engagement and accountability in the plan's progress. They will annually monitor and review each goal and objective to evaluate its:

- Relevance to current and evolving situations within the District
- Consistency with changes in local, state and federal policy

Under the direction of the OCSD General Manager, the Planning group will make certain that the mitigation goals are being implemented in accordance with the Plan and also review the risk assessment component of the plan to ascertain if the information needs to be updated or modified. They will report on the:

- Current status of their mitigation actions
- How coordination efforts are proceeding
- Implementation processes that worked well
- Any difficulties encountered
- Any strategies in need of revision

If the plan review leads the Hazard Mitigation Planning Group to determine that modifications are necessary, then the OCSD General Manager will initiate a plan amendment.



Attachment A: Definition of Terms/Acronyms

DEFINITION OF TERMS

Asset

Any natural or human-caused feature that has value, including, but not limited to people; buildings; infrastructure like bridges, roads, and sewer and water systems; lifelines like electricity and communication resources; or environmental, cultural, or recreational features like parks, dunes, wetlands, or landmarks.

Critical Facilities

Facilities that are critical to the health and welfare of the population and that are especially important following hazard events. Critical facilities include, but are not limited to, shelters, police and fire stations, and hospitals.

Disaster Mitigation Act of 2000

A law signed by the President on October 30, 2000 that encourages and rewards local and state pre-disaster planning, promotes sustainability as a strategy for disaster resistance, and is intended to integrate state and local planning with the aim of strengthening statewide mitigation planning.

Emergency Response Plan

A document that contains information on the actions that may be taken by a governmental jurisdiction to protect people and property before, during, and after a disaster.

Federal Emergency Management Agency (FEMA)

Part of the Department of Homeland Security's Emergency and Response Directorate, FEMA was created to provide a single point of accountability for all Federal activities related to disaster mitigation and emergency preparedness, response and recovery.

Flood Insurance Rate Map (FIRM)

Map of a community, prepared by FEMA, that shows the special flood hazard areas and the risk premium zones applicable to the community.

Frequency

A measure of how often events of a particular magnitude are expected to occur. Frequency describes how often a hazard of a specific magnitude, duration, and/or extent typically occurs, on average.

Geographic Information Systems (GIS)

A computer software application that relates physical features on the earth to a database to be used for mapping and analysis.

**Hazard Event**

A specific occurrence of a particular type of hazard.

Hazard Mitigation

Cost effective measures taken to reduce or eliminate long-term risk associated with hazards and their effects.

Hazard Profile

A description of the physical characteristics of hazards and a determination of various descriptors including magnitude, duration, frequency, probability, and extent.

HAZUS

A GIS-based nationally standardized earthquake loss estimation tool developed by FEMA.

Mitigate

To cause to become less harsh or hostile; to make less severe or painful. Mitigation activities are actions taken to eliminate or reduce the probability of the event, or reduce its severity of consequences, either prior to or following a disaster/emergency.

100-Hundred Year Floodplain

Also referred to as the Base Flood Elevation (BFE) and Special Flood Hazard Area (SFHA). An area within a floodplain having a 1 percent or greater chance of flood occurrence in any given year.

Repetitive Loss Property

A property that is currently insured for which two or more National Flood Insurance Program losses (occurring more than ten days apart) of at least \$1000 each have been paid within any 10-year period since 1978.

Richter Magnitude Scale

A logarithmic scale devised by seismologist C.F. Richter in 1935 to express the total amount of energy released by an earthquake. While the scale has no upper limit, values are typically between 1 and 9, and each increase of 1 represents a 32-fold increase in released energy.

Risk

The estimated impact that a hazard would have on people, services, facilities, and structures in a community; the likelihood of a hazard event resulting in an adverse condition that causes injury or damage. Risk is often expressed in relative terms such as a high, moderate, or low likelihood of sustaining damage beyond a particular threshold due to a specific type of hazard event. It also can be expressed in terms of potential monetary losses associated with the intensity of the hazard.



Vulnerability

Describes how exposed or susceptible to damage an asset is. Vulnerability depends on an asset's construction, contents, and the economic value of its functions. Like indirect damages, the vulnerability of one element of the community is often related to the vulnerability of another. For example, many businesses depend on uninterrupted electrical power—if an electric substation is flooded, it will affect not only the substation itself, but a number of businesses as well. Often, indirect effects can be much more widespread and damaging than direct effects.

Vulnerability Analysis

The extent of injury and damage that may result from a hazard event of a given intensity in a given area. The vulnerability analysis should address impacts of hazard events on the existing and future built environment.

Vulnerable Populations

Any segment of the population that is more vulnerable to the effects of hazards because of things such as lack of mobility, sensitivity to environmental factors, or physical abilities. These populations can include, but are not limited to, senior citizens and school children.



Acronym	Definition
CGS	California Geological Survey
Cal EPA	California Environmental Protection Agency
Caltrans	California Department of Transportation
CAL Fire	California Department of Forestry and Fire Protection
CDF	California Department of Forestry and Fire Protection
CDHS	California Department of Health Services
CFR	Code of Federal Regulations
CGS	California Geological Survey
CISN	California Integrated Seismic Network
CSSC	California Seismic Safety Commission
DFG	State Department of Fish and Game
DHS	Department of Homeland Security
DWR	Department of Water Resources
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map
FMA	Flood Mitigation Assistance
FMP	Floodplain Management Plan
FRAP	Fire and Resource Assessment Program
GIS	Geographic Information System
HMGP	Hazard Mitigation Grant Program
LHMP	Local Hazard Mitigation Plan
NFIP	National Flood Insurance Program
NOAA	National Oceanic and Atmospheric Administration
NPS	National Park Services
OES	Governor's Office of Emergency Services
SEMS	Standardized Emergency Management System
SFHA	Special Flood Hazard Area
USDA	U.S. Department of Agriculture
USGS	U.S. Geological Survey



Attachment B: Notice to Neighboring, Local and Regional Agencies

The following notices were sent to the City of Arroyo Grande, the City of Grover Beach, the City of Pismo Beach, San Luis Obispo County Office of Emergency Services and Port San Luis Harbor District.

Category Five Professional Consultants, Inc.



June 4, 2018

Dear Neighboring Community:

The Oceano Community Services District will be constructing a Local Hazard Mitigation Plan in order to uncover effective ways to reduce the jurisdiction's vulnerability to naturally occurring hazards. A Hazard Mitigation Planning Group has been formed comprised of community stakeholders. We will be holding a kick-off meeting on Thursday, June 7th at the Oceano Community Services District Office at 1655 Front Street in Oceano. We invite you to attend this meeting and participate in this process.

For more information and comments please contact the District's consultant for the project, Bob Neumann at 805-441-5469 or via email at bob@cafive.com.

Thank You,

Robert F Neumann and Sheri Eibschutz
Category Five Professional Consultants, Inc

Category Five Professional Consultants, Inc.
Post Office Box 13736
San Luis Obispo, CA 93406
E-mail: bob@cafive.com, sheri@cafive.com
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www.cafive.com



Attachment C: Public Forum Notice

Category Five Professional Consultants, Inc.



October 24, 2018

Dear Neighboring Community:

The Local Hazard Mitigation Plan recently constructed for the Oceano Community Services District will be presented to the general public and neighboring jurisdictions at an Oceano Community Outreach event held on November 17, 2018 at the Oceano Community Center located at 1425 19th Street in Oceano. From 11:20 to 11:50 a.m., the Plan will be presented to the general public. Category Five Professional Consultants will describe how the plan was put together, what it entails, in addition to providing a detailed description of the mitigation goals and actions that are being proposed for this community. From 12:00 to 1:00 p.m., the public will have an opportunity to ask questions and comment on the plan.

We invite you to attend this community outreach event and provide us with your feedback.

Thank You,

Robert F Neumann and Sheri Eibschutz
Category Five Professional Consultants, Inc.

Category Five Professional Consultants, Inc.
Post Office Box 13736
San Luis Obispo, CA 93406
E-mail: bob@cafive.com, sheri@cafive.com
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Attachment D: Public Forum Community Notice



Sponsors: The Oceano Community Services District, the County of San Luis Obispo and many local government and non-profit agencies who serve Oceano.

The Event: Community members will have the opportunity to meet with the representatives, learn about, discuss and provide feedback regarding current efforts in Oceano:

Water
Reliability &
Reclaimed Water

Energy
Efficiency, Solar
& New Electric
Rates

Infrastructure
Drainage &
replacing leaky
pipes

Planning
Hazard Mitigation
& Development

When: Saturday, November 17, 2018 | 10 AM- 1 PM

Where: Oceano Community Center - 1425 19th St., Oceano

Our lead organizers, presenters and supporters include...



Additional participants include...

Coastal San Luis RCD | CAPSLO | Sun Work | PG&E | One Cool Earth
Oceano Beach Community Association | Habitat for Humanity

N.1 District Profile

N.1.1 Mitigation Planning History and 2019 Process

This Annex was created during the development of the 2019 San Luis Obispo County Hazard Mitigation Plan Update. The Director of Utilities was the representative on the County HMPC and took the lead for developing this annex in coordination with the San Miguel Community Services District Local Planning Team (LPT). The LPT will be responsible for implementation and maintenance of the plan. Table N.1 shows the District's planning group for the plan revision process.

Table N.1 San Miguel CSD Hazard Mitigation Plan Planning Team

Department or Stakeholder	Title
San Miguel Fire	Fire Chief
San Miguel Fire	Assistant Fire Chief
Utilities	Director

More details on the planning process followed and how the jurisdictions, service districts and stakeholders participated as well as how the public was involved during the 2019 update can be found in Section 3 of the Base Plan.

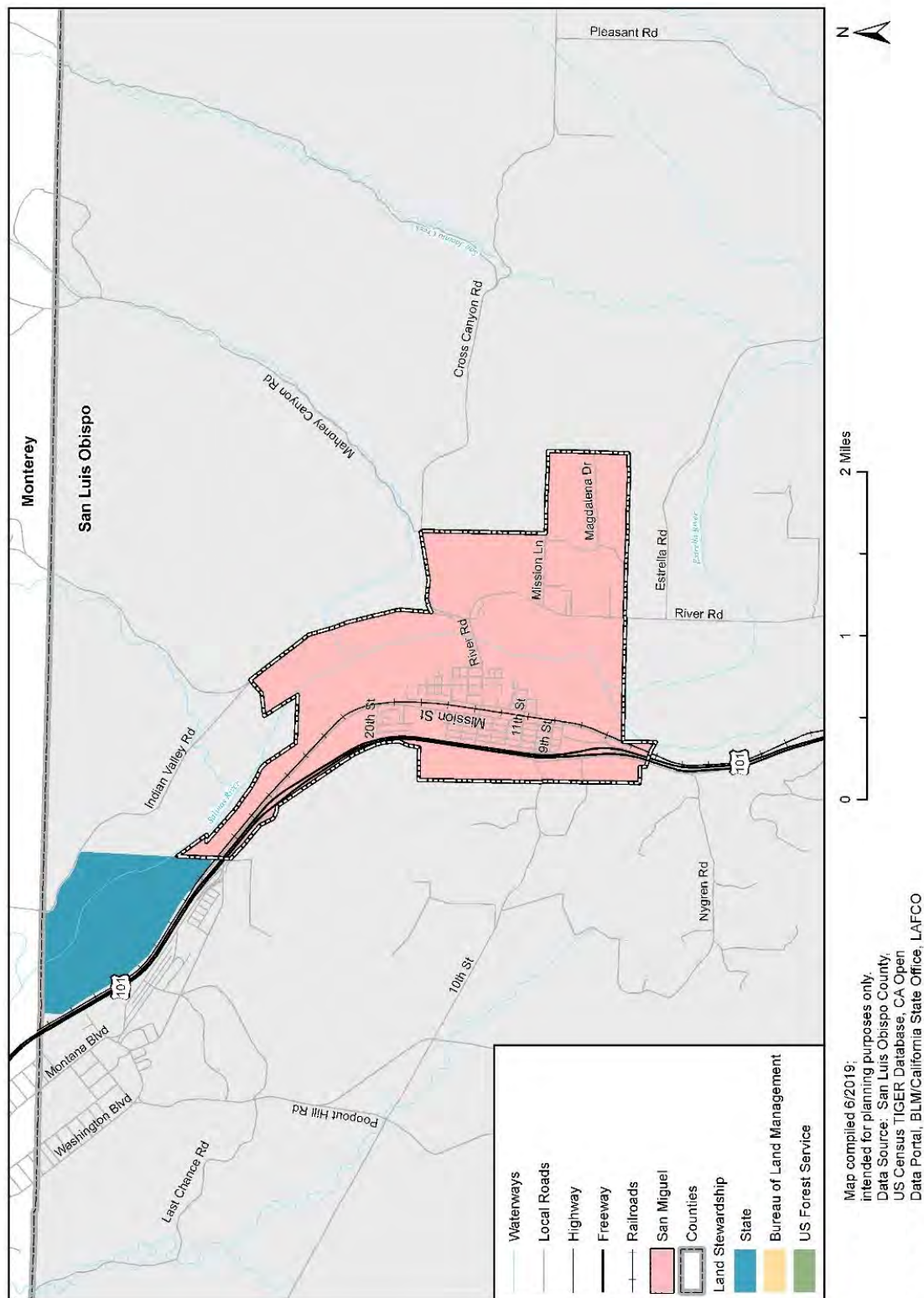
N.1.2 District Overview

The unincorporated community of San Miguel has a population of 2,400 according to the 2010 census and is located in the Salinas River Valley about seven miles north of Paso Robles. The community is bordered on the west by Highway 101 and on the east by the Salinas River. San Miguel originated with the founding of Mission San Miguel Arcángel in 1797. The railroad arrived in 1886, and still runs through the center of town. In 1887 San Miguel was destroyed by fire, but the town was soon rebuilt. During World War II, San Miguel became the off-duty retreat for 45,000 troops stationed at Camp Roberts, which was later deactivated in the late 1950s. San Miguel is currently perceived as a low-cost bedroom community for Paso Robles and San Luis Obispo County.

The San Miguel Community Services District (CSD) is committed to serving the community with effectiveness, efficiency, and care to support the economic and social quality of life in San Miguel. The District proudly serves San Miguel with fire protection, street lighting, water, wastewater, and solid waste services. Figure N.1 shows the San Miguel Community Services District boundaries.



Figure N.1 San Miguel Community Services District



The U.S. Census Bureau estimated the San Miguel Census Designated Place's (CDP) 2017 population as 2,824, a 0.1% increase from 2,822 in 2012. Table N.2 shows an overview of key social and demographic characteristics of the CDP taken from the U.S. Census Bureau's American Community Survey.

Table N.2 San Miguel CDP Demographic and Social Characteristics, 2012-2017

San Miguel CDP	2012	2017	% Change
Population	2,822	2,824	0.1%
Median Age	27.5	30.3	10.2%
Total Housing Units	818	837	2.3%
Housing Occupancy Rate	100.0%	92.5%	-7.5%
% of Housing Units with no Vehicles Available	6.1%	6.6%	0.5%
Median Home Value	\$232,600	\$294,700	26.7%
Unemployment	13.2%	12.2%	-1.0%
Mean Travel Time to Work (minutes)	21.6	24.8	14.8%
Median Household Income	\$44,450	\$53,750	20.9%
Per Capita Income	\$18,712	\$22,380	19.6%
% of Individuals Below Poverty Level	20.4%	22.7%	2.3%
# of Households	818	774	-5.4%
Average Household Size	3.43	3.63	5.8%
% of Population Over 25 with High School Diploma	73.2%	69.7%	-3.5%
% of Population Over 25 with Bachelor's Degree or Higher	8.4%	11.9%	3.5%
% with Disability	8.7%	8.1%	-0.6%
% Speak English less than "Very Well"	20.1%	27.0%	6.9%

Source: U.S. Census Bureau American Community Survey 2012-2017 5-Year Estimates, www.census.gov/

Note: Data is for the San Miguel Census Designated Place (CDP) which may not have the same boundaries as the San Miguel Community Services District.

Table N.3 shows how the San Miguel CDP's labor force breaks down by occupation and industry estimates from the U.S. Census Bureau's 2017 American Community Survey.

Table N.3 San Miguel CPD Employment by Industry (2017)

Industry	# Employed
Population (2017)	2,824
In Labor Force	1,312
Agriculture, forestry, fishing and hunting, and mining	117
Armed Forces	-
Construction	106
Manufacturing	145
Wholesale trade	-
Retail trade	103
Transportation and warehousing, and utilities	28
Information	15
Finance and insurance, and real estate and rental and leasing	44
Professional, scientific, and management, and administrative and waste management services	136



Industry	# Employed
Educational services, and health care and social assistance	172
Arts, entertainment, and recreation, and accommodation and food services	69
Other services, except public administration	142
Public administration	75
Unemployed	160

Source: U.S. Census Bureau American Community Survey 2012-2017 5-Year Estimates, www.census.gov/

Note: Data is for the San Miguel Census Designated Place (CDP) which may not have the same boundaries as the San Miguel Community Services District.

N.1.3 Development Trends

San Miguel's population growth has been slower compared to the nearby City of Paso Robles. According to the Community Plan, San Miguel is projected to have a population of 2,800 in 2020. According to the Planning Team, growth in San Miguel is currently limited to infill development and single-family homes. However multi-family housing developments are anticipated in the future, which the community hopes will encourage commercial development, particularly in the downtown area. The District believes that its historic resources and location make it suitable for more tourism-oriented development in the future and hope to attract small-scale manufacturing, which would bring more jobs to the community. Two sites outside the boundaries of the CSD have been identified as areas for potential community expansion. The District's main concerns with future growth are their ability to supply water and wastewater infrastructure and fire protection while keeping up with the growth.

N.1.4 Other Community Planning Efforts

The coordination and synchronization with other community planning mechanisms and efforts are vital to the success of this plan. To have a thorough evaluation of hazard mitigation practices already in place, appropriate planning procedures should also involve identifying and reviewing existing plans, policies, regulations, codes, tools, and other actions are designed to reduce a community's risk and vulnerability from natural hazards.

As an unincorporated community, the San Miguel CSD is referenced in other County planning documents and regulated by County policies and planning mechanisms. Integrating existing planning efforts, mitigation policies, and action strategies into this Annex establishes a credible, comprehensive document that weaves the common threads of a community's values together. The development of this jurisdictional Annex involved a comprehensive review of existing plans, studies, reports, and initiatives from San Luis Obispo County and the San Miguel community that relate to hazards or hazard mitigation, as summarized in Table N.4 below. Information on how they informed the update are noted and incorporated where applicable.

In addition to the development standards within the San Miguel Specific Plan, there are County planning mechanisms that regulate future and existing development within the San Miguel CSD planning area. Refer to subsection N.4 Capability Assessment below as well as the Base Plan for more information on the plans, policies, regulations and staff that govern the San Miguel CSD.

Table N.4 Summary of Review of Key Plans, Studies and Reports

Plan, Study, Report Name	How the Document Informed this Annex
San Miguel Community Plan (2016)	Incorporated background information on the community and CSD including historical and cultural resources, natural resources, and development and land use trends
North County Area Plan (2014)	Incorporated information into the District overview and vulnerability assessment.



N.2 Hazard Identification and Summary

The San Miguel CSD Planning Team identified the hazards that affect the District and summarized their frequency of occurrence, spatial extent, potential magnitude, and significance specific to the San Miguel CSD (see Table N.5). There are no hazards that are unique to the District.

Table N.5 San Miguel CSD Hazard Risk Summary

Hazard	Geographic Area	Probability of Future Occurrence	Magnitude/Severity (Extent)	Overall Significance
Adverse Weather	Extensive	Likely	Catastrophic	High
Dam Failure	Limited	Unlikely	Negligible	Medium
Drought and Water Shortage	Extensive	Likely	Catastrophic	High
Earthquake	Extensive	Likely	Critical	High
Flooding	Limited	Occasional	Limited	Medium
Landslide	Limited	Occasional	Limited	Medium
Wildfire	Extensive	Highly Likely	Catastrophic	High
Hazardous Materials	Significant	Likely	Negligible	Medium
Geographic Area Limited: Less than 10% of planning area Significant: 10-50% of planning area Extensive: 50-100% of planning area Probability of Future Occurrences Highly Likely: Near 100% chance of occurrence in next year or happens every year. Likely: Between 10 and 100% chance of occurrence in next year or has a recurrence interval of 10 years or less. Occasional: Between 1 and 10% chance of occurrence in the next year or has a recurrence interval of 11 to 100 years. Unlikely: Less than 1% chance of occurrence in next 100 years or has a recurrence interval of greater than every 100 years.		Magnitude/Severity (Extent) Catastrophic—More than 50 percent of property severely damaged; shutdown of facilities for more than 30 days; and/or multiple deaths Critical—25-50 percent of property severely damaged; shutdown of facilities for at least two weeks; and/or injuries and/or illnesses result in permanent disability Limited—10-25 percent of property severely damaged; shutdown of facilities for more than a week; and/or injuries/illnesses treatable do not result in permanent disability Negligible—Less than 10 percent of property severely damaged, shutdown of facilities and services for less than 24 hours; and/or injuries/illnesses treatable with first aid Significance Low: minimal potential impact Medium: moderate potential impact High: widespread potential impact		



N.3 Vulnerability Assessment

The intent of this section is to assess the San Miguel Community Services District's vulnerability separate from that of the planning area, which has already been assessed in Section 5 Hazard Identification and Risk Assessment (HIRA) in the Base Plan. This vulnerability assessment analyzes the population, property, and other assets at risk to hazards ranked of medium or high significance.

The information to support the HIRA portion of this Annex was collected through a Data Collection Guide, which was distributed to each participating municipality or district to complete during the planning process. Information collected was analyzed and summarized in order to identify and rank all the hazards that could impact anywhere within the County, as well as to rank the hazards and identify the related vulnerabilities unique to each jurisdiction/district. In addition, the San Miguel CSD Planning Team members were asked to share information on past significant hazard events that have affected the Community Services District.

Each participating jurisdiction and district were in support of the main hazard summary identified in Section 5 of the Base Plan. However, the hazard summary rankings for each jurisdictional annex may vary slightly due to specific hazard risk and vulnerabilities unique to that jurisdiction (see Table N.5). Identifying these differences helps the reader to differentiate the jurisdiction's risk and vulnerabilities from that of the overall County.

Note: The hazard "significance" reflects overall ranking for each hazard and is based on the San Miguel CSD Planning Team input from the Data Collection Guide and the risk assessment results compiled during the planning process (see Section 5 of the Base Plan), which included more detailed quantitative analyses with the best available data. The hazard summaries in Table N.5 reflect the hazards that could potentially affect the District. The discussion of vulnerability for each of the hazards listed is in subsection N.3.2 Estimating Potential Losses.

Other Hazards

The Planning Team also noted hazardous trees as a high significance hazard. This hazard is discussed under Adverse Weather below. For additional analysis on the risk hazardous trees pose the County, refer to Section 5 of the Base Plan.

Hazards assigned a significance rating of low and which do not differ significantly from the County ranking (e.g., Low vs. High) are not addressed further in this plan and are not assessed individually for specific vulnerabilities in this section. The following hazards were ranked as low significance in the San Miguel Community Services District:

- Agricultural Pests and Diseases
- Biological Agents
- Debris Flow
- Land Subsidence
- Landslides

Coastal hazards including coastal erosion, sea level rise, and tsunamis are not applicable to San Miguel due to its inland location.



N.3.1 Assets at Risk

This section considers the District's assets at risk, including values at risk, critical facilities and infrastructure, historic assets, economic assets, and growth and development trends. See subsection 5.2 of the Base Plan (Asset Summary) for more details and background on the parcel summarization, analysis, and datasets available.

Values at Risk

The following data on property exposure is derived from San Luis Obispo County Assessor data. This data should only be used as a guideline to overall values in the Community Services District, as the information has some limitations. Table N.6 summarizes the exposure of properties (e.g., the values at risk based on improvement values, content values, and total values as an addition of these two types of values) broken down by property type for the San Miguel Community Services District.

Table N.6 2019 Property Exposure for the San Miguel CSD by Property Types

Property Type	Property Count	Improved Value	Content Value	Total Value
Agricultural	6	\$29,459,170	\$29,459,170	\$58,918,340
Commercial	17	\$2,736,007	\$2,736,007	\$5,472,014
Government/Utilities	42	\$125,432	--	\$125,432
Other/Exempt/Misc.	39	\$5,734,772	--	\$5,734,772
Residential	661	\$98,664,423	\$49,332,212	\$147,996,635
Multi-Family Residential	64	\$8,938,593	\$4,469,297	\$13,407,890
Mobile/Manufactured Homes	23	\$3,263,643	\$1,631,822	\$4,895,465
Residential: Other	2	\$606,170	\$303,355	\$910,065
Vacant	13	\$274,143	--	\$274,143
Total	867	\$149,802,353	\$87,931,862	\$237,734,755

Source: Wood Plc analysis based on ParcelQuest and San Luis Obispo County Assessor's Office data 2019

Critical Facilities and Infrastructure

A critical facility is defined as one that is essential in providing utility or direction either during the response to an emergency or during the recovery operation. See Section 5 of the Base Plan for more details on the definitions and categories of critical facilities.

An inventory of critical facilities in the San Miguel Community Services District based on San Luis Obispo County GIS data as well as structures obtained from the Homeland Infrastructure Foundation-Level Dataset (HIFLD) is provided in Table N.7 and illustrated in Figure N.2. Table N.8 lists additional critical assets identified by the Planning Team. The four types of Critical Facilities categorized by San Luis Obispo County and its jurisdictions' and districts' Planning Teams are: Emergency Services, High Potential Loss Facilities, Lifeline Utility Systems, and Transportation Systems. Refer to subsection 5.2 of the Base Plan for more information on the assets used throughout this Annex and County-wide analyses.



Table N.7 San Miguel CSD's Critical Facilities

Facility Category	Facility Type	Name	Counts
Emergency Services	Day Care Facility	CA State Preschool at San Miguel	1
	Fire Station	San Miguel CSD Fire Department	1
	Public Schools	Almond Acres Charter Academy	2
		Lillian Larsen Elementary	
Lifeline Utility Systems	CA Energy Commission Substations	San Miguel PG&E Substation	1
Total			5

Source: San Luis Obispo County Planning & Building, HIFLD

The following table lists the additional assets within the District as identified by the Planning Team. Additional discussion on assets in San Miguel can be found below.

Table N.8 Critical Assets Identified by San Miguel Planning Team

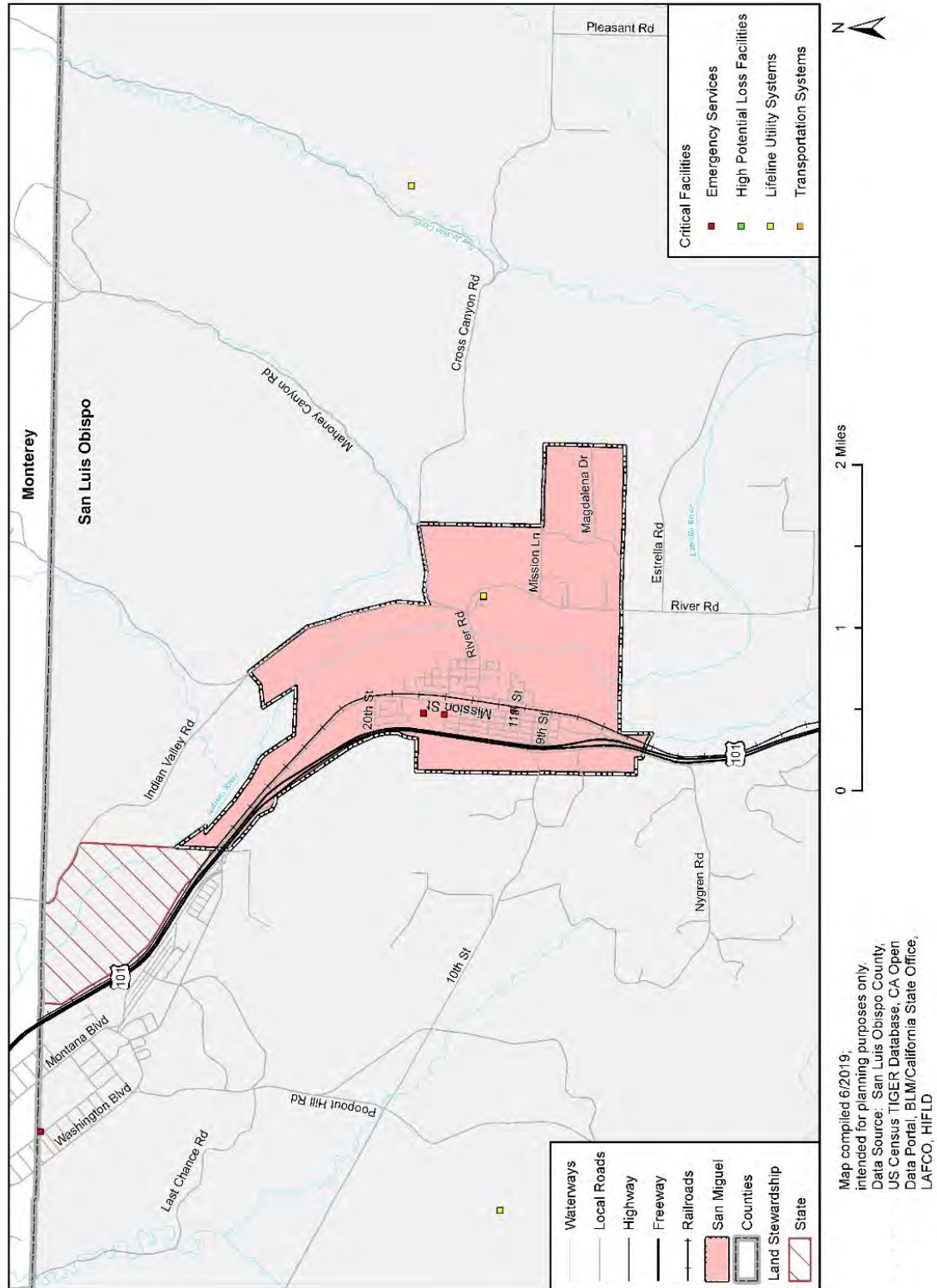
Name of Asset	Type	Replacement Value
San Miguel Fire Department	EI	\$500,000
PG&E Substation	EI	\$1,500,000
Version Substation	EI	\$300,000
River Road Bridge	EI	\$1,000,000
Mission San Miguel	NA*	\$3,000,000
Rios Caledonia	NA*	\$2,000,000
Highway 101	VF	\$6,000,000
Water Infrastructure	EI	\$5,000,000
Waste water treatment plant	EI	\$1,500,000
Natural gas line	EI	\$1,000,000
Union Pacific Railroad	EI	\$1,500,000
CHC	VF	\$750,000
Lillian Larson School	VF	\$2,000,000
Almond Acres Charter School	VF	\$1,000,000
Gallo Wines	VF	\$4,000,000

Source: San Miguel CSD Planning Team.

EI: Essential Infrastructure. NA: Natural Asset. VF: Vulnerable Facility. * = State registered landmark



Figure N.2 Critical Facilities in San Miguel Community Services District



Emergency Services Facilities

Emergency services facilities in San Miguel include a health center, day care, fire department, and schools. San Miguel is served by the San Miguel Joint Union School District (SMJUSD) for Kindergarten through Grade 8. The District operates Lillian Larsen Elementary School in San Miguel. The Almond Acres Charter Academy is operated independently on the same campus as the elementary school. There is also a preschool on campus which is operated by the State. The community is served by non-profit Community Health Centers of the Central Coast. Fire protection is provided through San Miguel Fire, which has mutual aid agreements with CalFire and Camp Roberts.

Lifeline Utility Systems

Lifeline utility systems in San Miguel include one electrical substation, natural gas lines, 3 well sites, 2 water storage tanks with 700,000 gallons of storage capacity, and a wastewater treatment facility. In 2013, all of San Miguel's water needs were met by two of its three wells. The San Miguel CSD also operates the Machado Wastewater Treatment Plant, which serves 90% of the District including areas east of the Salinas River.

Transportation Systems

The Planning Team identified the following critical transportation infrastructure; the River Road Bridge, Highway 101, and the Union Pacific Railroad. Mission Street is San Miguel's main street and primary commercial corridor. Highway 101 is the principal arterial in the region, and the River Road Bridge is the only crossing of the Salinas River between Paso Robles and Camp Roberts. The Union Pacific Railroad travels through the center of town. While it once played an important role in the economy of San Miguel, trains no longer stop in San Miguel.

Historic and Cultural Resources

There are two state historical landmarks within San Miguel that attract many visitors, Mission San Miguel Arcángel and Rios Caledonia Adobe. The Mission was founded in 1797 and has been occupied and administered by the Franciscan Friars of the Province of Saint Barbara since 1928. Rios Caledonia Adobe was built in 1835 and historically served as an inn and stage stop on the Mission Trail between San Francisco and Los Angeles. Both sites are an important part of the local heritage. Gallo Wines was also identified by the community as an important cultural resource.

Natural Resources

Natural resources are important to include in benefit-cost analyses for future projects and may be used to leverage additional funding for projects that also contribute to community goals for protecting sensitive natural resources. Awareness of natural assets can lead to opportunities for meeting multiple objectives. For instance, protecting wetlands areas protects sensitive habitat as well as attenuates and stores floodwaters. The San Miguel Community Plan (2016) designated the following combining designation that applies to the protection of special resources in the San Miguel community:

- Salinas River Corridor (SRA) – The Salinas River Corridor is home to sensitive riparian habitat and important wildlife migration corridors. It is also important for flood control and management of water resources.

The two primary plant communities in the area are willow-cottonwood riparian forest and non-native annual grassland. Several special-status plant species inhabit the San Miguel community and are detailed in the San Miguel Community Plan.

Economic Assets

According to the San Miguel Community Plan, San Miguel's history has been marked by boom and bust cycles, often in response to fluctuations in the agricultural economy and the military's use of nearby Camp Roberts. The major economic sectors in San Miguel are agriculture, tourism, and manufacturing. According to the San Miguel

Community Plan, agriculture in the area has shifted over time from cattle to most recently dry-farmed pasture crops such as alfalfa, almonds, olives, and wine grapes. The Community Plan states that as of 2016 San Miguel qualified under state law as a disadvantaged community based on per capita income. Few “head-of-household” jobs exist in the community, and many residents commute to Paso Robles or beyond for employment and to obtain many basic goods and services.

N.3.2 Estimating Potential Losses

Note: This section details vulnerability to specific hazards of high or medium significance, where quantifiable, and/or where (according to Planning Team input) it significantly differs from that of the overall County.

Table N.6 under subsection N.3.1 summarizes San Miguel’s exposure in terms of number and value of parcels falling within the District’s boundaries. San Luis Obispo County parcel and assessor data was used to calculate the improved value of parcels, using ParcelQuest’s spatial layers on parcel geometry. The most vulnerable structures are those in the floodplain (especially those that have been flooded in the past), unreinforced masonry buildings, and buildings built prior to the introduction of modern-day building or land regulatory codes. According to San Miguel Fire, San Miguel has not experienced a hazardous event in the past 75 years. However, the community is still vulnerable to several hazards which are discussed below. See Section 5 of the Base Plan for more information on assets, parcel analysis methodology, and hazard profiles.

Adverse Weather

Adverse weather was rated as High Significance for the San Miguel CSD and may include thunderstorms, heavy rain, hail, lightning, dense fog, freeze, high winds, tornadoes, and extreme heat. San Miguel receives about 17 inches of rainfall annually, most of which occurs in the spring. As such, the community is most vulnerable to flooding, erosion, landslide, and other water-associated hazards in the springtime. Hazardous trees are also a significant concern of the community. Older neighborhoods in particular are distinguished by the presence of mature trees which may be downed by winds and storms. Refer to Section 5 of the Base Plan for further analysis on hazardous trees within the County.

Dam Failure

Dam failure was rated as Medium Significance. The San Miguel CSD is located downstream of the Salinas Dam which impounds Santa Margarita Lake. The Salinas Dam was constructed in 1941 to supply water to Camp San Luis Obispo. Today, the dam is operated by the City of San Luis Obispo to supply water to the City and surrounding agricultural areas. Expansion of the dam was explored as part of the 2013 Salinas Reservoir Expansion Study, but it was found that the dam would not maintain structural integrity at the increased capacity. It was also found that the dam was vulnerable to failure in a prolonged earthquake, although the dam does meet design requirements at its current capacity. The area of San Miguel that would become inundated if the Salinas Dam failed is shown in Figure N.3. Most of this area is uninhabited. As shown in Table N.9, 5 structures with a total value of \$136,389 would be inundated in the event of a dam failure.



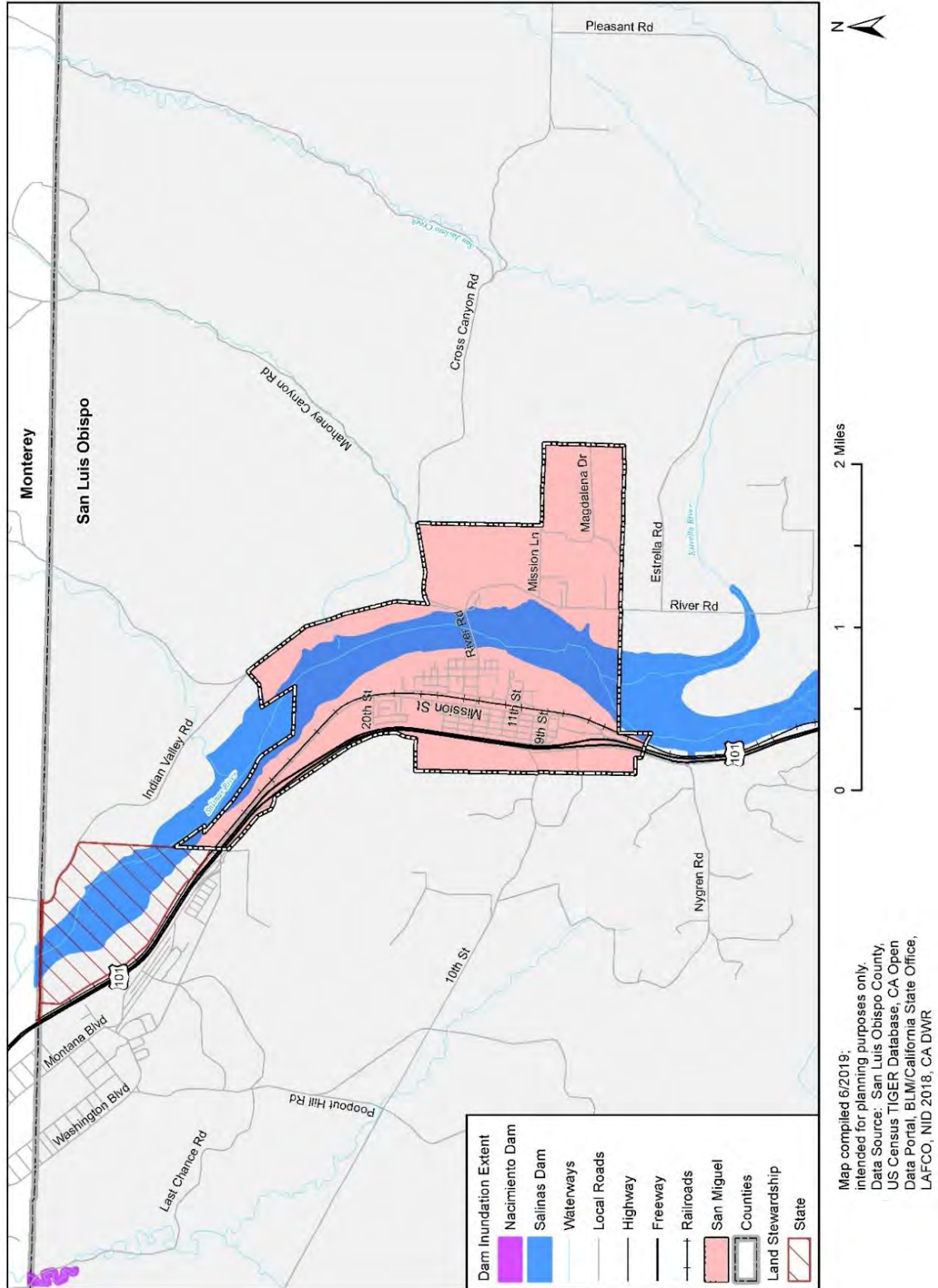
Table N.9 San Miguel CSD's Estimated Losses by Property Type based on Salinas Dam Inundation Extents

Property Type	Parcel Count	Improved Value	Content Value	Total Value	Loss Estimate	Population at Risk
Agricultural	1	\$5,384	\$5,384	\$10,768	\$5,384	--
Government/Utilities	1	--	--	\$0	\$0	--
Other/Exempt/Miscellaneous	1	--	--	\$0	\$0	--
Residential	1	\$53,182	\$26,591	\$79,773	\$39,887	3
Vacant	1	\$45,848	--	\$45,848	\$22,924	--
TOTAL	5	\$104,414	\$31,975	\$136,389	\$68,195	3

Source: San Luis Obispo County Planning and Building Dept., Assessor's Office, ParcelQuest, Wood Plc Parcel Analysis



Figure N.3 Dam Inundation Extents in San Miguel Community Services District



Drought and Water Shortage

Drought was rated as High Significance by the San Miguel CSD and has historically contributed to the boom and bust economic cycles in the community in terms of the agricultural sector. The cultivation of water-intensive crops, particularly alfalfa and almonds, makes the agricultural community in San Miguel especially vulnerable to water shortage. According to the San Miguel Community Plan, in 2010 San Miguel's gross water use was 239 acre-feet; this is expected to increase to 483 acre-feet per year by 2035. Concentrated pumping within the greater Paso Robles Groundwater Basin has created localized depressions and has depleted groundwater reserves. The County Board of Supervisors designed the Paso Robles Groundwater Basin a Level of Severity III. As such, the water resource management strategy for San Miguel includes conservation, efficiency, and a supplemental source of water. More details on this strategy can be found in the San Miguel Community Plan. Information related to Sustainable Groundwater Management Act and the Paso Robles Groundwater Basin can be found in Section 5 of the Base Plan.

Earthquake

Earthquake was rated as High Significance by the San Miguel CSD. There are no mapped active or potentially active faults in San Miguel, though the community is still vulnerable to earthquakes from regional faults. The San Simeon earthquake in 2003 was centered about 30 miles from San Miguel, and caused damage to Mission San Miguel Arcángel, forcing it to close to the public temporarily. Restoration and retrofitting are still ongoing and are expected to total \$15 million. Some buildings in the downtown area between 11th and 14th Streets date back to the early 1900s and may also be vulnerable to an earthquake. The Sims Hotel, specifically, has been identified as an unreinforced masonry building in need of retrofit per Title 19 of the County Code and SB 547.

Liquefaction, the result of groundshaking leading to fine grained, saturate soils to liquefy and act as a fluid also poses a risk to portions of the San Miguel CSD. The following tables, Table N.10 and Table N.11, show the properties in zones of moderate and high liquefaction risk. As shown in



Figure N.4 below, proximity to the Salinas River is the most significant indicator of liquefaction risk in the community. Most properties are at moderate risk of liquefaction in an earthquake, including all critical facilities except the Community Health Center, as indicated in Table N.11. Very few properties are located in an area of high liquefaction risk.

Table N.10 San Miguel CSD's Liquefaction Risk by Property Type – Moderate Risk

Property Type	Property Count	Improved Value	Content Value	Total Value
Agricultural	1	\$27,093,506	\$27,093,506	\$54,187,012
Commercial	17	\$2,736,007	\$2,736,007	\$5,472,014
Government/Utilities	32	\$125,432	--	\$125,432
Other/Exempt/Misc.	35	\$5,734,772	--	\$5,734,772
Residential	564	\$83,310,708	\$41,655,354	\$124,966,062
Multi-Family Residential	63	\$8,842,353	\$4,421,177	\$13,263,530
Mobile/Manufactured Homes	6	\$1,099,667	\$549,834	\$1,649,501
Residential: Other	2	\$606,710	\$303,355	\$910,065
Vacant	11	\$166,569	--	\$166,569
Total	731	\$129,75,724	\$76,759,232	\$206,474,956

Source: San Luis Obispo County Planning and Building Dept., Assessor's Office, ParcelQuest, Wood Plc Parcel Analysis

Table N.11 San Miguel CSD's Liquefaction Risk by Property Type – High Risk

Property Type	Property Count	Improved Value	Content Value	Total Value
Agricultural	1	\$5,384	\$5,384	\$10,768
Government/Utilities	2	--	--	\$0
Other/Exempt/Misc.	1	--	--	\$0
Residential	1	\$53,182	\$26,591	\$79,773
Total	5	\$58,566	\$31,975	\$90,541

Source: San Luis Obispo County Planning and Building Dept., Assessor's Office, ParcelQuest, Wood Plc Parcel Analysis

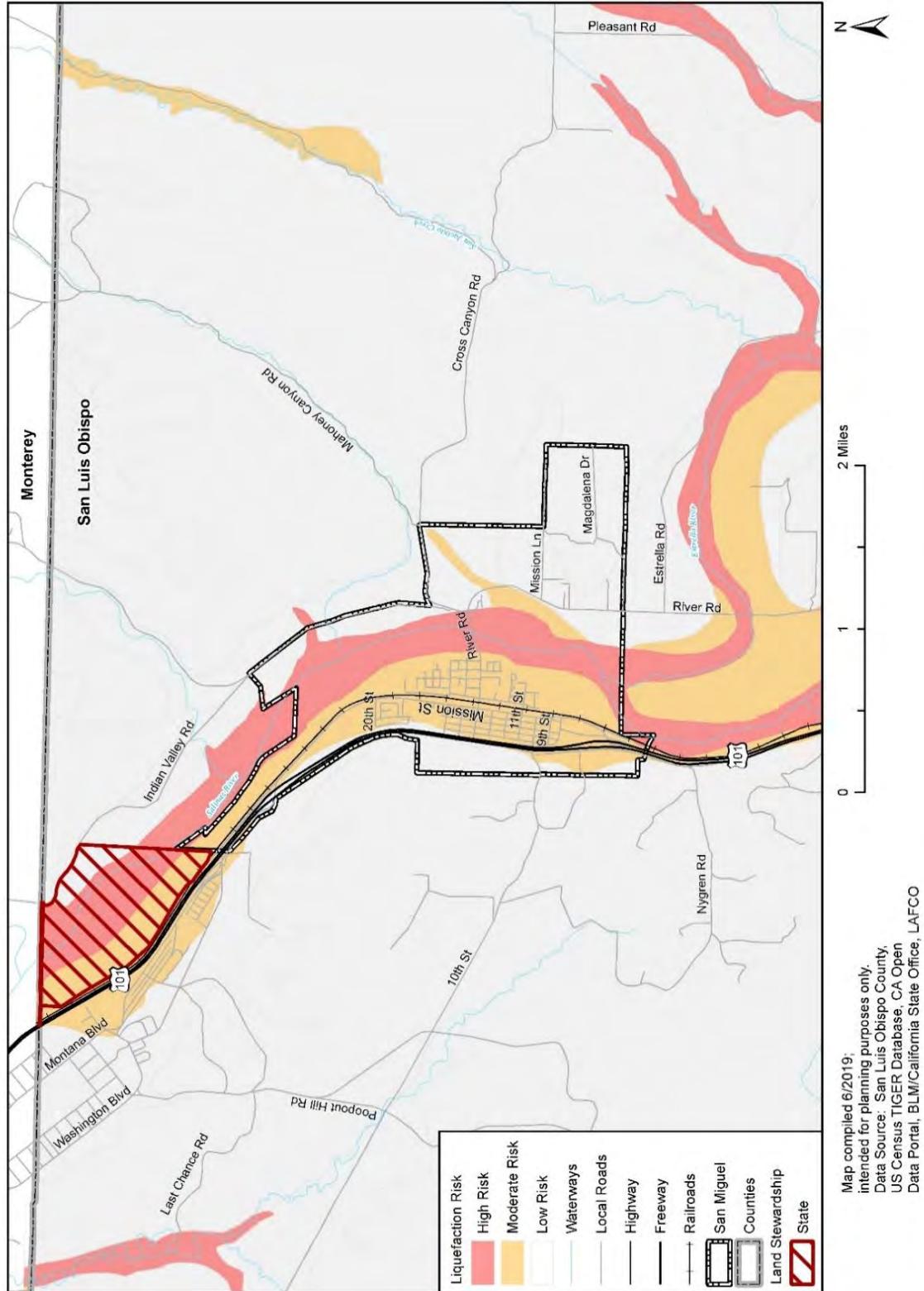
Table N.12 San Miguel CSD's Critical Facilities in Moderate Liquefaction Hazard Zone

Facility Type	Count
Day Care Facility	1
Fire Station	1
Public Schools	2
Total	4

Source: San Luis Obispo County Planning and Building Dept., Assessor's Office, ParcelQuest, Wood Plc Parcel Analysis, CalFire



Figure N.4 Liquefaction Risk in San Miguel Community Services District



Flood

Flooding was rated as Medium Significance by the planning team. The Salinas River corridor is characterized by steep slope banks, sandy bottoms, and riparian vegetation. San Miguel is situated on two terraces connected by a steep slope, and water drains eastward into the river. Properties in the 100-year floodplain are primarily located on the lower terrace. Because of the lack of storm drains, low points in the community are sometimes inundated during periods of heavy rainfall. These areas are generally along N Street and Mission Street between 12th and 16th Streets. A comprehensive drainage study was prepared for San Miguel in 2003 and the associated drainage plan is being implemented incrementally as new development occurs. Table N.13 details the potential damage to properties in a 100-year flood. As shown in Figure N.5, only a small portion of the community is located in the 100-year floodplain.

Table N.13 San Miguel CSD's FEMA 1% Annual Chance Flood Hazard by Property Type

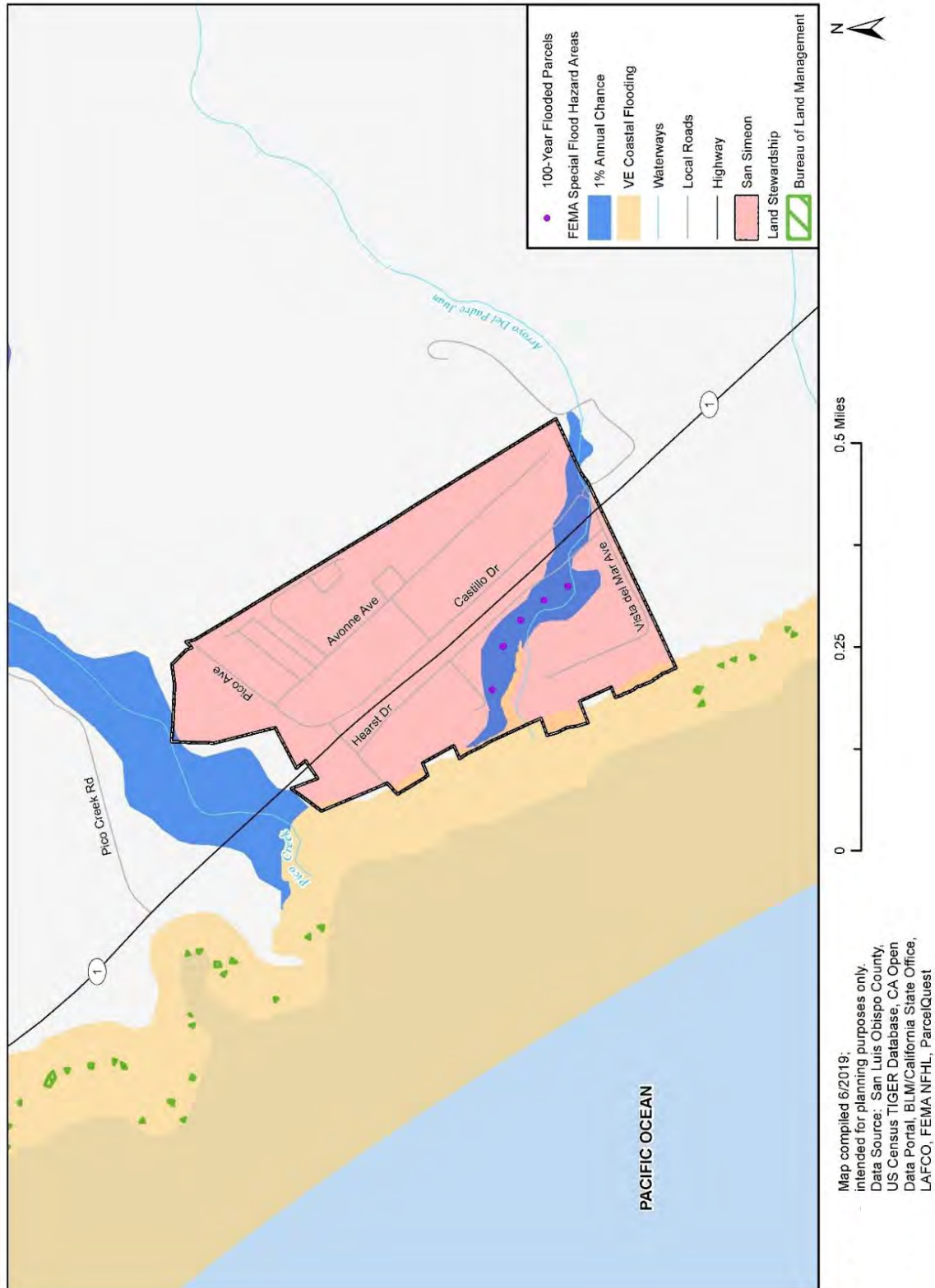
Property Type	Property Count	Improved Value	Content Value	Total Value	Loss Estimate	Population
Agricultural	1	\$5,384	\$5,384	\$10,768	\$2,692	--
Government/Utilities	3	--	--	\$0	\$0	--
Other/Exempt/Miscellaneous	3	--	--	\$0	\$0	--
Residential	25	\$4,028,643	\$2,014,322	\$6,042,965	\$1,510,741	63
Multi-Family Residential	1	\$74,968	\$37,484	\$112,452	\$28,113	3
Total	33	\$4,108,995	\$2,057,190	\$6,166,185	\$1,541,546	66

Source: San Luis Obispo County Planning and Building Dept., Assessor's Office, ParcelQuest, Wood Plc Parcel Analysis, FEMA NFHL

San Miguel does not participate separately in the National Flood Insurance Program (NFIP) but will continue to support the County's participation in and compliance with the NFIP.



Figure N.5 FEMA Flood Hazard Areas and Flooded Parcels in San Miguel Community Services District



Landslide

As shown in Figure N.6, only a small portion of the San Miguel CSD is at moderate risk of landslide. However, areas outside of the District's boundaries to the north and the southwest are at high to moderate risk of a landslide event. According to the GIS analysis, there are a total of twenty-five (25) properties with a total value of over \$2 million. Of the properties at risk, eighteen (18) are residential or multi-family property types. These properties are listed in Table N.14.

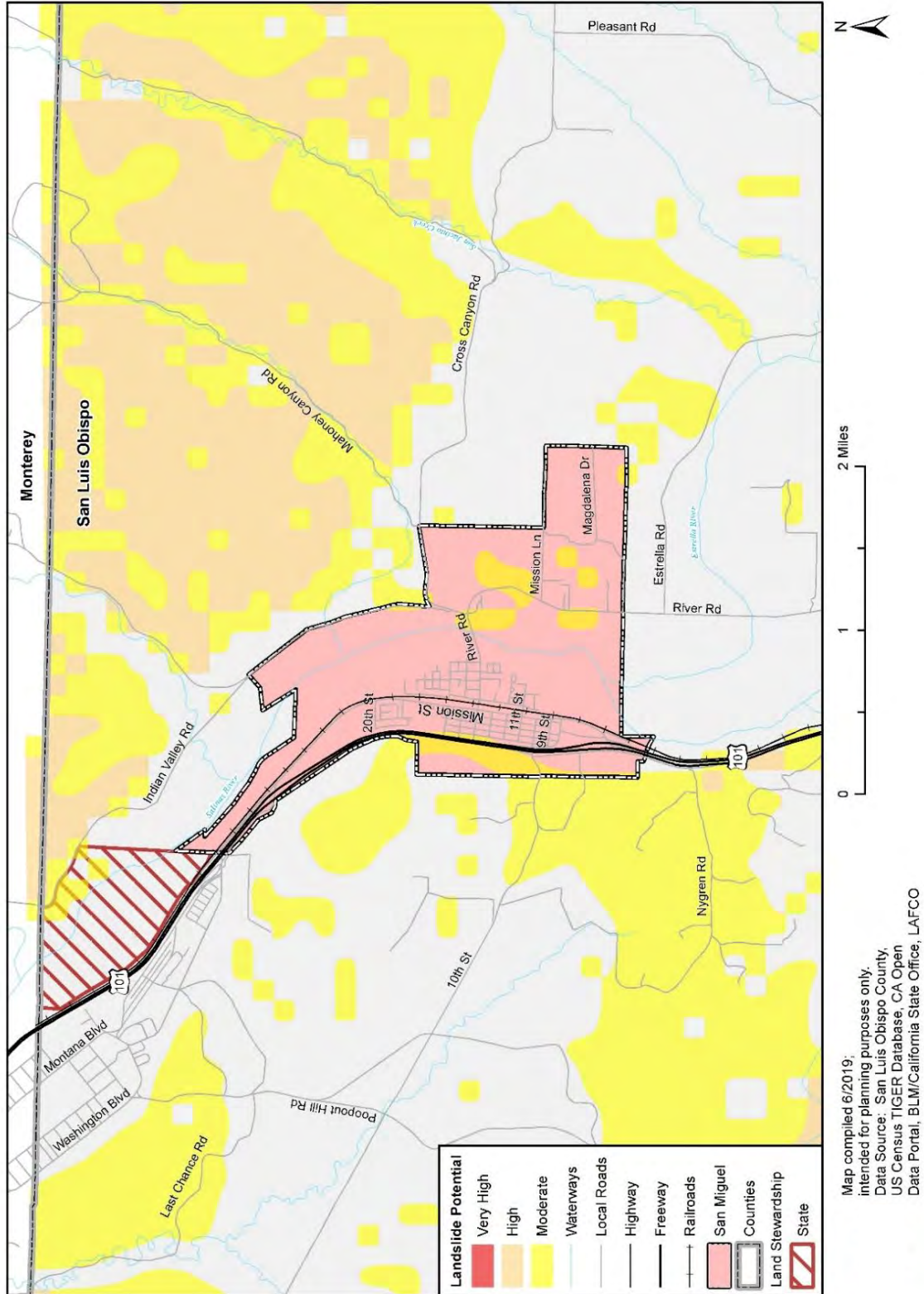
Table N.14 San Miguel CSD's Landslide Risk by Property Type – Moderate

Property Type	Property Count	Improved Value	Content Value	Total Value
Government/Utilities	4	--	--	\$0
Mobile/Manufactured Homes	1	\$95,795	\$47,898	\$143,693
Multi-Family Residential	1	\$23,149	\$11,575	\$34,724
Residential	17	\$1,553,215	\$776,608	\$2,329,823
Vacant	2	\$2,143	--	\$2,143
Total	25	\$1,674,302	\$836,080	\$2,510,382

Source: San Luis Obispo County Planning and Building Dept., Assessor's Office, ParcelQuest, Wood Plc Parcel Analysis



Figure N.6 Landslide Potential Areas in San Miguel Community Services District



Wildfire

Wildfire is a high significance hazard for the San Miguel CSD and recently CalFire has designated San Miguel as an area at increased risk of wildfire. About one-third of the total property value in San Miguel is located in a high wildfire hazard zone (refer to the table below). Most of the at-risk properties are located outside the downtown area, as shown in Figure N.7. As shown below, the properties at risk of wildfire includes all agricultural property and most mobile homes within the District's boundaries. The District's fire station is also located in a high wildfire hazard zone, which poses a significant threat to the District's ability to respond quickly and efficiently to a fire emergency.

Table N.15 San Miguel CSD's Wildfire Risk by Property Type – High Wildfire Hazard Zone

Property Type	Property Count	Improved Value	Content Value	Total Value	Loss Estimate	Population
Agricultural	6	\$29,459,170	\$29,459,170	\$58,918,340	\$58,918,340	--
Government/Utilities	11	--	--	\$0	\$0	--
Other/Exempt/ Miscellaneous	4	--	--	\$0	\$0	--
Residential	69	\$11,430,126	\$5,715,063	\$17,145,189	\$17,145,189	173
Multi-Family Residential	1	\$96,240	\$48,120	\$144,360	\$144,360	3
Mobile/Manufactured Homes	18	\$2,422,543	\$1,211,272	\$3,633,815	\$3,633,815	45
Vacant	3	\$108,199	--	\$108,199	\$108,199	--
Total	112	\$43,516,278	\$36,433,625	\$79,949,903	\$79,949,903	221

Source: San Luis Obispo County Planning and Building Dept., Assessor's Office, ParcelQuest, Wood Plc Parcel Analysis, CalFire

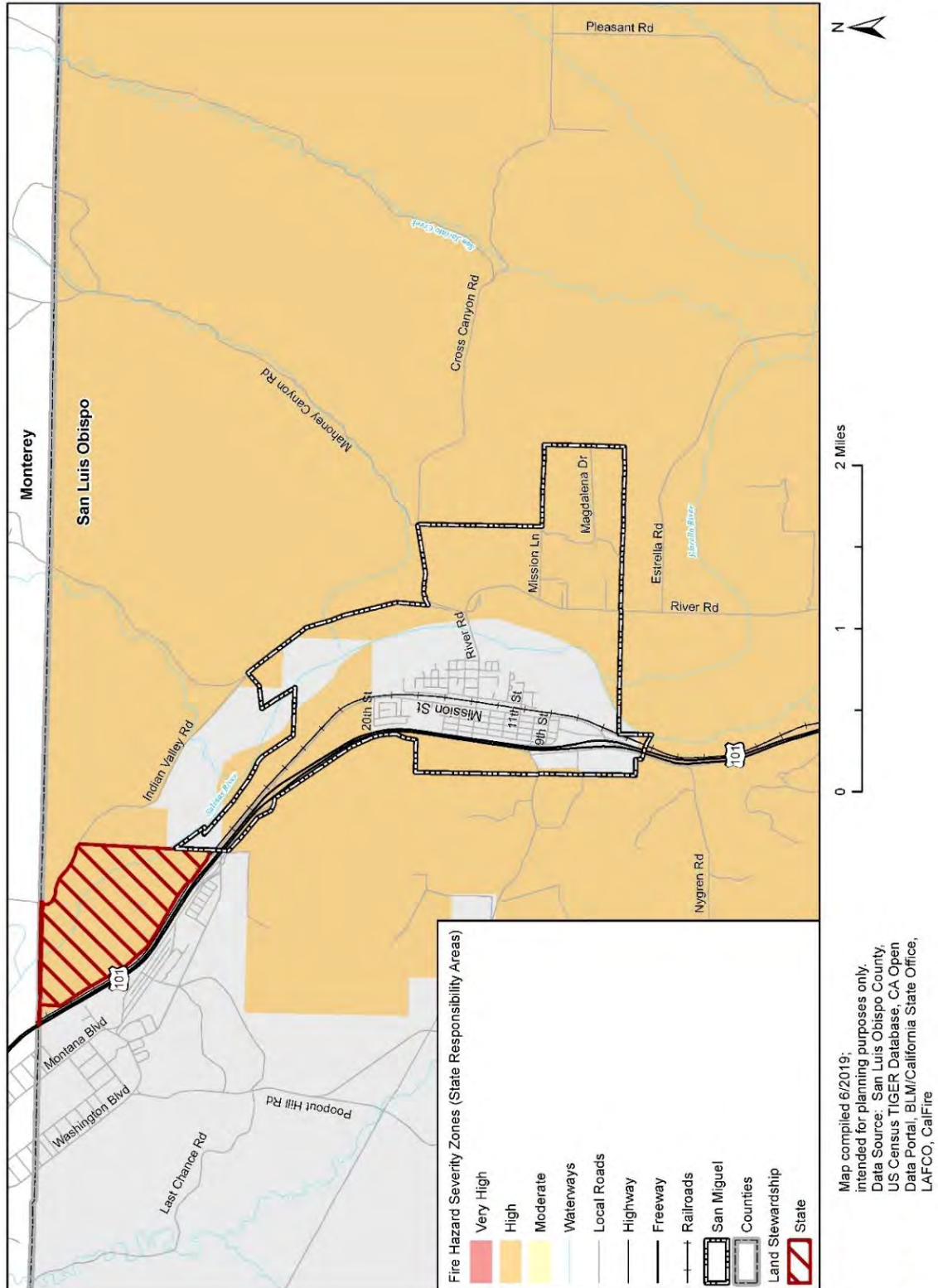
Table N.16 San Miguel CSD's Critical Facilities in High Wildfire Hazard Zone

Facility Type	Count
Fire Station	1
Emergency Medical Service Station	1
Total	2

Source: San Luis Obispo County Planning and Building Dept., Assessor's Office, ParcelQuest, Wood Plc Parcel Analysis, CalFire



Figure N.7 Fire Hazard Severity Zones in San Miguel Community Services District



Hazardous Materials

The Cal OES Warning Center reports six hazardous materials incidents in the San Miguel CSD from 1994 through October 24, 2018; as noted in subsection 5.3.16 of the Base Plan, this likely excludes a large number of unreported minor spills. (Cal OES reports an additional 209 incidents in unincorporated San Luis Obispo County, however a lack of data makes it difficult to know if any of those took place within the CSD boundaries.) This constitutes 0.3% of the hazardous materials incidents reported county-wide during the same time frame, and averages out to roughly one incident every four years. As noted in subsection 5.3.16, only around 6% of reported hazardous materials incidents result in injuries, fatalities, or evacuations.

N.4 Capability Assessment

Capabilities are the programs and policies currently in use to reduce hazard impacts or that could be used to implement hazard mitigation activities. This capability assessment is divided into five sections: regulatory mitigation capabilities, administrative and technical mitigation capabilities, fiscal mitigation capabilities, mitigation outreach and partnerships, and other mitigation efforts.

To develop this capability assessment, the jurisdictional planning representatives used a matrix of common mitigation activities to inventory policies or programs in place. The team then supplemented this inventory by reviewing additional existing policies, regulations, plans, and programs to determine if they contributed to reducing hazard-related losses.

During the plan update process, this inventory was reviewed by the jurisdictional planning representatives and Wood consultant team staff to update information where applicable and note ways in which these capabilities have improved or expanded. In summarizing current capabilities and identifying gaps, the jurisdictional planning representatives also considered their ability to expand or improve upon existing policies and programs as potential new mitigation strategies. The San Miguel CSD capabilities are summarized below.

N.4.1 Regulatory Mitigation Capabilities

Table N.17 identifies existing regulatory capabilities the CSD has in place to help with future mitigation efforts. Note that many of the regulatory capabilities that can be used for the District are within the County's jurisdiction. Refer to Section 6 Capability Assessment of the Base Plan for specific information related to the County's mitigation capabilities.

Table N.17 San Miguel CSD Regulatory Mitigation Capabilities

Regulatory Tool	Yes/No	Comments
General plan	Yes	On file with the County
Zoning ordinance	Yes	On file with the County
Subdivision ordinance	Yes	On file with the County
Growth management ordinance	Yes	On file with the County
Floodplain ordinance	Yes	County
Other special purpose ordinance (stormwater, water conservation, wildfire)	Yes	County & Local Ordinances
Building code	Yes	County & Local Ordinances
Fire department ISO rating	Yes	
Erosion or sediment control program	Yes	County
Stormwater management program	Yes	County
Site plan review requirements	Yes	County & SMF Review
Capital improvements plan	Yes	
Economic development plan	Yes	



Regulatory Tool	Yes/No	Comments
Local emergency operations plan	Yes	
Other special plans	Yes	
Flood Insurance Study or other engineering study for streams	Yes	
Elevation certificates (for floodplain development)	Yes	County

N.4.2 Administrative/Technical Mitigation Capabilities

Table N.18 identifies the personnel responsible for activities related to mitigation and loss prevention in the San Miguel Community Services District

Table N.18 San Miguel CSD Administrative/Technical Mitigation Capabilities

Personnel Resources	Yes/No	Department/Position/Comments
Planner/engineer with knowledge of land development/land management practices	No	
Engineer/professional trained in construction practices related to buildings and/or infrastructure	No	District Engineer (Monsoon & Associates Consultant)
Planner/engineer/scientist with an understanding of natural hazards	No	
Personnel skilled in GIS	No	
Full time building official	No	Part-time Fire Inspector/Plans Examiner
Floodplain manager	No	N/A
Emergency manager	Yes	Fire Chief
Grant writer	Yes	District Engineer
Other personnel	Yes	Assistant Fire Chief/Prevention Officer (Fire Inspector/Plans Examiner)
GIS Data Resources (Hazard areas, critical facilities, land use, building footprints, etc.)	Yes	
Warning systems/services (Reverse 9-11, outdoor warning signals)	Yes	

N.4.3 Fiscal Mitigation Capabilities

Table N.19 identifies financial tools or resources that the City could potentially use to help fund mitigation activities.

Table N.19 San Miguel CSD Fiscal Mitigation Capabilities

Financial Resources	Accessible/Eligible to Use (Yes/No)
Community Development Block Grants	Yes
Capital improvements project funding	Yes (County)
Authority to levy taxes for specific purposes	No
Fees for water, sewer, gas, or electric services	Yes
Impact fees for new development	Yes
Incur debt through general obligation bonds	No
Incur debt through special tax bonds	No



Financial Resources	Accessible/Eligible to Use (Yes/No)
Incur debt through private activities	No
Withhold spending in hazard prone areas	No

N.4.4 Mitigation Outreach and Partnerships

San Miguel Fire provides Fire Safety Education and participates in Fire Prevention Week annually. San Miguel Fire is also working together with the local schools to develop a disaster response plan for the schools in San Miguel. San Miguel Fire is responsible for reviewing and approving construction documentation within the District Boundaries. San Miguel Fire applies 2019 CFC Chapter 49 and 2019 CBC Section 7A as appropriate on a project to project basis, requiring fire resistant building materials. San Miguel Fire also utilizes Local Ordinance 02-2019 (attached) requiring all new construction and qualifying remodel projects to be fully sprinklered.

N.4.5 Opportunities for Enhancement

Based on the capabilities assessment, the San Miguel Community Services District has several existing mechanisms in place that already help to mitigate hazards. There are also opportunities for the District to expand or improve on these policies and programs to further protect the community. Future improvements may include providing training for staff members related to hazards or hazard mitigation grant funding in partnership with the County and Cal OES. Additional training opportunities will help to inform District staff and board members on how best to integrate hazard information and mitigation projects into the District policies and ongoing duties of the District. Continuing to train District staff on mitigation and the hazards that pose a risk to the San Miguel Community Services District will lead to more informed staff members who can better communicate this information to the public.

San Miguel Fire is seeking funding in 2020 for the purchase of a 3,000 gallon tactical water tender. This would provide a valuable resource to the District, County and State. The availability of having 3,000 gallons of mobile water for the use of firefighting would improve the Districts overall ISO rating.

N.5 Mitigation Strategy

N.5.1 Mitigation Goals and Objectives

The San Miguel CSD adopts the hazard mitigation goals and objectives developed by the County Planning Team and described in Section 7 of the Base Plan: Mitigation Strategy.

N.5.2 Mitigation Actions

The Planning Team for the San Miguel Community Services District identified and prioritized the following mitigation actions based on the conducted risk assessment (refer to Table N.20). Actions were prioritized using the process described in subsection 7.2.1 of the Base Plan. Background information and information on how each action will be implemented and administered, such as ideas for implementation, responsible office, potential funding, estimated cost, and timeline are also included. Actions with an asterisk (*) are those that mitigate losses to future development. Due to limited resources and District responsibilities, including limited staff time, the San Miguel CSD has chosen not to undertake mitigation actions against adverse weather, dam incidents, or landslides at this time.




Table N.20 San Miguel Community Services District Mitigation Action Plan

ID	Hazard(s) Mitigated	Description/ Background/ Benefits	Lead Agency and Partners	Cost Estimate	Potential Funding	Priority	Timeline	Status/ Implementation Notes
SM.1	Wildfire	Improve ISO rating. As part of this project the District will sponsor a chipping program and green waste management program to support vegetation management/defensible space on properties within the district. The District will also provide public information to the Community Members on how to prepare homes creating Defensible Space, and Ready Set Go information as well. In addition the District is looking to purchase a 3,000 gallon tactical water tender.	Cal Fire	\$275,000	Capital Funds	High	18 Months	Annual implementation
SM.2	Wildfire	Increase fire department staffing	San Miguel Fire	\$100,000 annually	Property tax	Medium	2 years	Planning stage
SM.3	Flood, Earthquake	Replace the current wastewater treatment facility to current seismic design standards	San Miguel CSD, Monsoon Consultants	\$7,000,000	Grants from DWR, USDA, and CBDG	High	20 Months	Planning stage
SM.4	Drought and Water Shortage	Provide additional or larger water storage tanks	San Miguel CSD	\$500,000	San Miguel CSD and developers	Medium	3 years	Planning stage





ID	Hazard(s) Mitigated	Description/ Background/ Benefits	Lead Agency and Partners	Cost Estimate	Potential Funding	Priority	Timeline	Status/ Implementation Notes
SM.5	Drought and Water Shortage	Replace aging water and wastewater underground piping	San Miguel CSD	\$500,000	San Miguel CSD and developers	Medium	3-4 Years	Planning





N.6 Implementation and Maintenance

Moving forward, the San Miguel Community Services District will use the mitigation action table in the previous section to track progress on implementation of each project. Implementation of the plan overall is discussed in Section 8 Implementation and Monitoring of the Base Plan.

N.6.1 Incorporation into Existing Planning Mechanisms

The information contained within this plan, including results from the Vulnerability Assessment and the Mitigation Strategy will be used by the Community Services District to help inform the development of local plans, programs and policies. Understanding the hazards that pose a risk and the specific vulnerabilities to the jurisdiction will help in future capital improvement planning for the District. The County Planning and Building Department may utilize the hazard information when reviewing a site plan or other type of development applications with the boundaries of the San Miguel Community Services District area. As noted in Section 8 Implementation and Monitoring, the County's HMPC representatives from the San Miguel Community Services District will report on efforts to integrate the hazard mitigation plan into local plans, programs and policies and will report on these efforts at the annual HMPC and local Planning Team review meeting.

N.6.2 Monitoring, Evaluation and Updating the Plan

The San Miguel Community Services District will follow the procedures to monitor, review, and update this plan in accordance with San Luis Obispo County as outlined in Section 8 of the Base Plan. The District will continue to involve the public in mitigation, as described in subsection 8.3 of the Base Plan. The CSD General Manager will be responsible for representing the Community Services District in the County HMPC, and for coordination with County staff and departments during plan updates. The San Miguel Community Services District realizes it is important to review the plan regularly and update it every five years in accordance with the Disaster Mitigation Act Requirements as well as other State of California requirements.



O.1 District Profile

O.1.1 Mitigation Planning History and 2019 Process

This annex was created during the development of the 2019 San Luis Obispo County Hazard Mitigation Plan Update. The General Manager of the San Simeon Community Services District was the representative on the county Hazard Mitigation Planning Committee (HMPC) and took the lead for developing this annex in coordination with the San Simeon Community Services District (CSD) Local Planning Team (Planning Team). The local (District) Planning Team will be responsible for implementation and maintenance of the plan. Table O.1 summarizes the District's planning team for the plan revision process.

Table O.1 San Simeon CSD Hazard Mitigation Plan Planning Team

Department or Stakeholder	Title
Administration	General Manager
Fire	Battalion Chief
Water	Superintendent

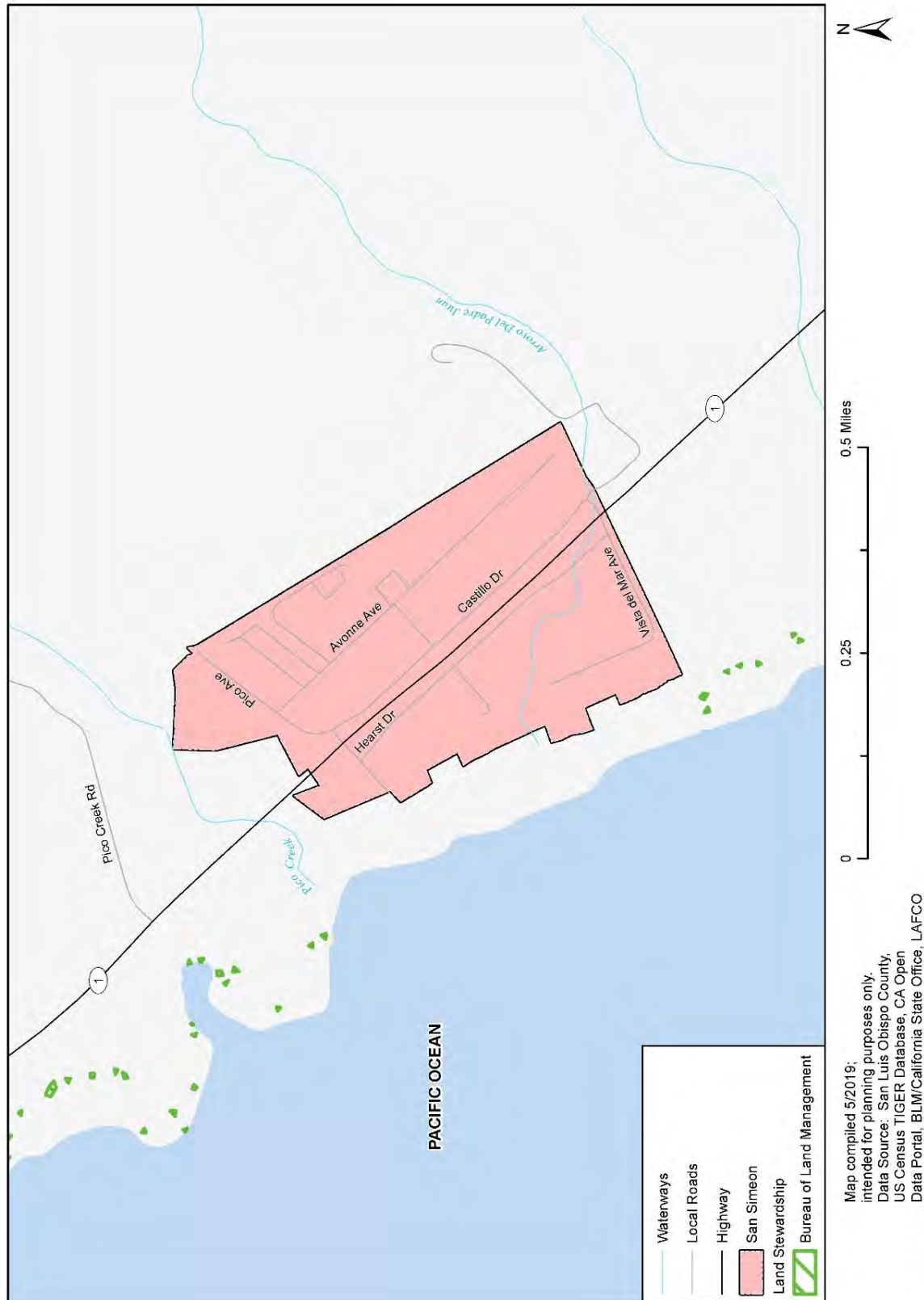
More details on the planning process followed and how the jurisdictions, Services Districts and stakeholders participated can be found in Section 3 of the Base Plan, as well as how the public was involved during the 2019 update.

O.1.2 District Overview

San Simeon is a small unincorporated community that is part of the North Coast planning area in San Luis Obispo County. The population was about 462 according to the 2010 Census. San Simeon is located along State Highway 1 about five minutes north of the community of Cambria. It is bordered on the west by the Pacific Ocean and on the east by open space owned by Hearst Corporation. Figure O.1 shows the San Simeon Community Services District boundaries and geographic context. The major land holding in the area is the Hearst Ranch, which encompasses 77,000 acres north of Pico Creek. San Simeon is located on a coastal plain; its climate is considered Mediterranean and is moderated somewhat by its proximity to the Pacific Ocean.

Founded in 1836, San Simeon was first established when the San Miguel Mission was secularized and divided into three distinct ranches: Piedras Blancas, Santa Rosa, and San Simeon. In the years after its founding, the town became known for its whale watching. Modern development in the area began in the 1960s, and the primary economic activity in the area is now tourism. The San Simeon Community Services District was founded in 1961 for the purpose of providing San Simeon with safe, adequate and reliable utility services in an environmentally sensitive and economically responsible manner. Because tourism represents a major component of the CSD's economy, water use, and wastewater production notably increase in the spring and summer months. Recycled water service as well as reverse osmosis has been implemented in recent years, and a 150,000-gallon storage service with approximately 397 customer accounts are now offered in San Simeon. The CSD is governed by a five-member elected board of directors as well as committees focusing on water and budget issues.

Figure O.1 San Simeon Community Services District



The U.S. Census Bureau estimated the San Simeon Census Designated Place's (CDP) 2017 population as 523, a 1.9% increase from 513 in 2012. Table O.2 shows an overview of key social and demographic characteristics of the CDP taken from the U.S. Census Bureau's American Community Survey.

Table O.2 San Simeon CDP Demographic and Social Characteristics, 2014-2017

San Simeon CDP	2012	2017	% Change
Population	513	523	1.9%
Median Age	41.0	30.4	-25.9%
Total Housing Units	305	309	1.3%
Housing Occupancy Rate	63.9%	72.2%	8.3%
% of Housing Units with no Vehicles Available	0.0%	13.0%	13.0%
Median Home Value	\$237,000	NA	NA
Unemployment	0.0%	9.2%	9.2%
Mean Travel Time to Work (minutes)	28.0	11.6	-58.6%
Median Household Income	\$51,250	NA	NA
Per Capita Income	\$24,838	\$22,498	-9.4%
% of Individuals Below Poverty Level	0.0%	18.7%	18.7%
# of Households	195	223	14.4%
Average Household Size	2.51	2.21	-12.0%
% of Population Over 25 with High School Diploma	89.7%	71.7%	-18.0%
% of Population Over 25 with Bachelor's Degree or Higher	11.4%	5.7%	-5.7%
% with Disability	8.4%	3.8%	-4.6%

Source: U.S. Census Bureau American Community Survey 2014-2017 3-Year Estimates, www.census.gov/

Note: Data is for the San Simeon Census Designated Place (CDP) which may not have the same boundaries as the San Simeon Community Services District.

Table O.3 shows how the San Simeon CDP's labor force breaks down by occupation and industry estimates from the U.S. Census Bureau's 2017 American Community Survey.

Table O.3 San Simeon CDP Employment by Industry (2017)

Industry	# Employed
Population (2017)	523
In Labor Force	315
Agriculture, forestry, fishing and hunting, and mining	8
Armed Forces	161
Construction	39
Manufacturing	17
Wholesale trade	32
Retail trade	29
Transportation and warehousing, and utilities	-
Information	-
Finance and insurance, and real estate and rental and leasing	29
Professional, scientific, and management, and administrative and waste management services	-

Industry	# Employed
Educational services, and health care and social assistance	-
Arts, entertainment, and recreation, and accommodation and food services	-
Other services, except public administration	-
Public administration	-
Unemployed	-

Source: U.S. Census Bureau American Community Survey 2012-2017 5-Year Estimates, www.census.gov/

Note: Data is for the San Simeon Census Designated Place (CDP) which may not have the same boundaries as the San Simeon Community Services District.

Note: A symbol of "-" indicates that the metric in question is unknown or undetermined.

O.1.3 Development Trends

Growth rates in the North Coast region of San Luis Obispo County have traditionally been high, but growth rates in San Simeon have been declining during the past ten years due to resource constraints and development restrictions. The County's Growth Management Ordinance limits county-wide growth to 2.3%. According to the North Coast Area Plan, the community does not believe that sustaining past growth rates is wise and has no intent to do so. Overcrowding of the day use and overnight facilities at San Simeon recreation areas underscores this point, as does the need for more visitor facilities. Improvements to the Hearst Ranch are being planned and are detailed in the North Coast Area Plan, as are intensive visitor-serving commercial centers which are currently in the conceptual planning stages.

O.1.4 Other Community Planning Efforts

The coordination and synchronization with other community planning mechanisms and efforts are vital to the success of this plan. To have a thorough evaluation of hazard mitigation practices already in place, appropriate planning procedures should also involve identifying and reviewing existing plans, policies, regulations, codes, tools, and other actions are designed to reduce a community's risk and vulnerability from natural hazards.

San Simeon and the San Simeon CSD are referenced in other County planning documents and regulated by County policies and planning mechanisms. Integrating existing planning efforts, mitigation policies, and action strategies into this Annex establishes a credible, comprehensive document that weaves the common threads of a community's values together. The development of this CSD Annex involved a comprehensive review of existing plans, studies, reports, and initiatives from San Luis Obispo County and the San Simeon community that relate to hazards or hazard mitigation, as summarized in Table O.4 below. Information on how they informed the update are noted and incorporated where applicable.

In addition to the development standards within the San Simeon Specific Plan, there are County planning mechanisms that regulate future and existing development within the San Simeon CSD planning area. Refer to subsection O.4 Capability Assessment as well as the Base Plan for more information on the plans, policies, regulations and staff that govern the San Simeon CSD.

Table O.4 Summary of Review of Key Plans, Studies and Reports for the San Simeon CSD

Plan, Study, Report Name	How the Document Informed this Annex
San Simeon CSD Master Plan (Draft 2018)	Obtained key information on the CSD, its history, hazards of interest, etc.
North Coast Area Plan (Revised 2018)	Obtained water use information, drought related details, etc.
San Luis Obispo County Stormwater Resource Plan (2019)	Provided background information that was incorporated into the Drought Vulnerability Assessment related to watershed planning
County of San Luis Obispo Local Hazard Mitigation Plan (2014)	Informed past hazard event history as well as information on county programs, etc.
San Luis Obispo County – Community Wildfire Protection Plan (March 2019)	Informed the Vulnerability Assessment for Wildfire risk
San Luis Obispo County 2014 Integrated Regional Water Management Plan	Obtained information on water use in the CSD, water management regions, and the drought/water scarcity hazard
State of California’s Hazard Mitigation Plan – Updated 2018	General information on hazards, events, and vulnerability assessments
2014-2016 Resource Summary Report for San Luis Obispo County’s General Plan	Pulled information about water resources, reliability, and ongoing efforts to increase resilience in the county and district of San Simeon as related to drought
Coastal Zone Framework for Planning (Revised September 2018)	This Framework for Planning for the Coastal Zone is a General Plan Element that accompanies the Coastal Zone Land Use Ordinance (Title 23) for the County of San Luis Obispo
Title 23 Coastal Zone Land Use Ordinance (Revised September 2018) – County of San Luis Obispo	Pulled information on land use codes
Ordinance No. 112	An Ordinance of the Board of Directors of the San Simeon Community Services District Mandating Use of Recycled Water Strictly for the San Simeon Community Services District’s Recycled Water Facilities

O.2 Hazard Identification and Summary

The San Simeon CSD planning team identified the hazards that affect the District and summarized their frequency of occurrence, spatial coverage, potential magnitude, and significance specific to the San Simeon CSD (see Table O.5). There are no hazards that are unique to the District. Note that some hazards may have been added to include ratings due to their relevance in the CSD, or because GIS analysis shows they could cause damages or losses in the community.

Table O.5 San Simeon CSD Hazard Risk Summary

Hazard	Geographic Area	Probability of Future Occurrence	Magnitude/Severity (Extent)	Overall Significance
Coastal Storm/Coastal Erosion/Sea Level Rise	Significant	Likely	Limited	Low
Drought and Water Shortage	Significant	Likely	Limited	Medium
Earthquake	Significant	Likely	Limited	High
Flood	Limited	Likely	Negligible	Low
Tsunami	Limited	Unlikely	Negligible	Low
Wildfire	Significant	Likely	Limited	Medium
Human Caused: Hazardous Materials	Limited	Highly Likely	Negligible	Medium
Geographic Area Limited: Less than 10% of planning area Significant: 10-50% of planning area Extensive: 50-100% of planning area Probability of Future Occurrences Highly Likely: Near 100% chance of occurrence in next year or happens every year. Likely: Between 10 and 100% chance of occurrence in next year or has a recurrence interval of 10 years or less. Occasional: Between 1 and 10% chance of occurrence in the next year or has a recurrence interval of 11 to 100 years. Unlikely: Less than 1% chance of occurrence in next 100 years or has a recurrence interval of greater than every 100 years.		Magnitude/Severity (Extent) Catastrophic—More than 50 percent of property severely damaged; shutdown of facilities for more than 30 days; and/or multiple deaths Critical—25-50 percent of property severely damaged; shutdown of facilities for at least two weeks; and/or injuries and/or illnesses result in permanent disability Limited—10-25 percent of property severely damaged; shutdown of facilities for more than a week; and/or injuries/illnesses treatable do not result in permanent disability Negligible—Less than 10 percent of property severely damaged, shutdown of facilities and services for less than 24 hours; and/or injuries/illnesses treatable with first aid Significance Low: minimal potential impact Medium: moderate potential impact High: widespread potential impact		

O.3 Vulnerability Assessment

The intent of this section is to assess the San Simeon CSD's vulnerability separate from that of the planning area (San Luis Obispo County), which has already been assessed in Section 5 Hazard Identification and Risk Assessment in the Base Plan. This vulnerability assessment analyzes the population, property, and other assets (e.g. critical facilities) at risk to hazards ranked of medium or high significance that may vary from other parts of the planning area, or hazards that are rated as Low, but which may be worth noting due to risk of property and populations.

The key information to support the Hazard Identification and Risk Assessment (HIRA) for this Annex was collected through a Data Collection Guide, which was distributed to each participating municipality, community

Services District, or special district to complete during the planning process. Information collected was analyzed and summarized in order to identify and rank all the hazards that could impact anywhere within the County, as well as to rank the hazards and identify the related vulnerabilities unique to each jurisdiction/district. In addition, the San Simeon CSD planning team was asked to share information on past hazard events that have affected the District.

Each participating jurisdiction or district was in support of the main hazard summary identified in the Base plan (See Table 5.1 in the Base Plan). However, the hazard summary rankings for each jurisdictional annex may vary slightly due to specific hazard risk and vulnerabilities unique to that jurisdiction (see Table O.5). Identifying these differences helps the reader to differentiate the District's risk and vulnerabilities from that of the overall County.

Note: The hazard "Significance" reflects overall ranking for each hazard and is based on the San Simeon CSD planning team input from the Data Collection Guide in conjunction with the risk assessment developed during the planning process (see Section 5 of the Base Plan), which included more detailed quantitative and qualitative analyses with best available data for all hazards in the County.

The hazard summaries in Table O.5 reflect the hazards that could potentially affect the District in major ways. The discussion of vulnerability for each of the assessed hazards is contained in the following sections. Those of Medium or High significance for the San Simeon CSD are identified below.

- Drought/Water Shortage
- Earthquake
- Human Caused: Hazardous Materials
- Wildfire

Other Hazards

Hazards assigned a significance rating of Low and which do not differ significantly from the County ranking (e.g., Low vs. High) are not addressed further in this plan and are not assessed individually for specific vulnerabilities in this section. Additionally, the CSD's committee members decided to rate several hazards as Not Applicable (N/A) to the planning area due to a lack of exposure, vulnerability, and no probability of occurrence. The following hazards are considered Not Applicable (N/A) to the San Simeon Community Services District.

- Adverse Weather
- Agricultural Pests and Plant Diseases
- Biological Agents
- Coastal Storm/Coastal Erosion/Sea Level Rise (will be profiled in a limited manner)
- Dam Failure
- Land Subsidence
- Landslide/Debris Flow

O.3.1 Assets at Risk

This section considers the District's assets at risk, including values at risk, critical facilities and infrastructure, historic assets, economic assets, and growth and development trends. See subsection 5.2 of the Base Plan (Asset Summary) for more details and background on the parcel summarization, analysis, and datasets available.

Values at Risk

The following data on property exposure is derived from the San Luis Obispo County's Assessor data. This data should only be used as a guideline to overall values in the Community Services District as the information has

some limitations. Table O.6 summarizes the exposure of properties (e.g., the values at risk) broken down by property type for the San Simeon Community Services District.

Table O.6 Exposures for the San Simeon CSD by Parcel Type

Property Type	Parcel Count	Improved Value	Content Value	Total Value
Commercial	4	\$1,688,119	\$1,688,119	\$3,376,238
Government/Utilities	3	--	--	\$0
Other/Exempt/Misc.	11	--	--	\$0
Residential	5	\$817,165	\$408,583	\$1,225,748
Multi-Family Residential	157	\$26,869,358	\$13,434,679	\$40,304,037
Mobile/Manufactured Homes	1	\$186,709	\$93,355	\$280,064
Residential - Other	16	\$22,989,087	\$11,494,544	\$34,483,631
Total	197	\$52,550,438	\$27,119,279	\$79,669,717

Source: Wood Plc analysis based on ParcelQuest and San Luis Obispo County Assessor's Office data 2019

Critical Facilities and Infrastructure

A critical facility is defined as one that is essential in providing utility or direction either during the response to an emergency or during the recovery operation. The four types of Critical Facilities categorized by San Luis Obispo County and its jurisdictions' and districts' planning teams are: Emergency Services, High Potential Loss Facilities, Lifeline Utility Systems, and Transportation Systems. See Section 5 of the Base Plan for more details on the definitions and categories of critical facilities, and subsection 5.2 of the Base Plan for more information on the Assets used throughout this annex and the county-wide analyses.

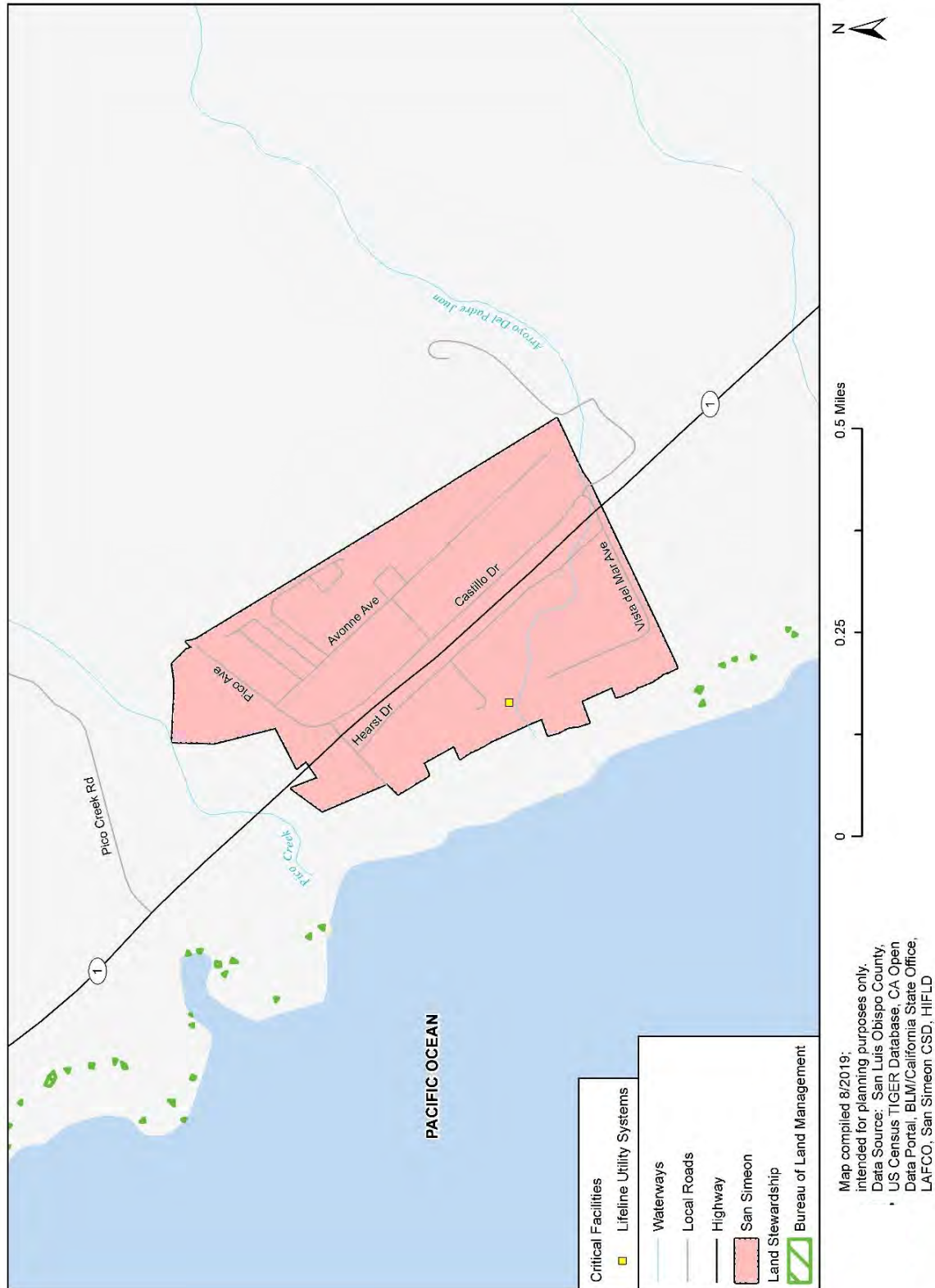
Based on the datasets provided by the San Luis Obispo County GIS Department and the San Simeon CSD Planning Team, along with those structures supplemented from the Homeland Infrastructure Foundation-Level Dataset (HIFLD), there is only 1 critical facility found within the San Simeon Community Services District boundaries. It is the San Simeon Wastewater Treatment Plant located at 9245 Balboa Ave. This facility is shown on a map of the CSD in Figure O.2 below, classified as a Lifeline Utility System facility.

Additional Critical Facilities

Additional critical facilities as identified by the San Simeon CSD Planning Team are as follows:

- District Office – \$395,000 replacement value
- Senior Mobile Home Park
- Wells 1 & 2 – \$600,000 replacement value (combined)
- Water Treatment Plant – \$1.5 million replacement value
- Reservoir – \$750,000 replacement value
- Recycled Water Plant – \$500,000 replacement value
- Wastewater Treatment Plant - \$6,000,000 replacement value
- Water & Sewer Pipes – \$11.2 million replacement value (about 2 miles of water distribution system plus 2 miles of collection system)
- Critical Roads – \$832,000 replacement value (about 2 miles of roads)
- Reverse Osmosis - \$1,500,000
- Pico Creek – natural resource

Figure O.2 Wastewater Treatment Plant Critical Facility in the San Simeon Community Services District



Emergency Service Facilities/Support from Other Communities

The CSD is serviced by Cal Fire Station 10 in Cambria and the San Luis Obispo County Sheriff. The 2005 Cambria and San Simeon Acres Community Plans of the North Coast Area Plan Final Environmental Impact Report indicated that emergency response is a significant unmet need.

Transportation, High Potential Loss, and Lifeline Facilities

The San Simeon CSD provides water and wastewater services to San Simeon and the surrounding community. The San Simeon Wastewater Treatment Plant is the main critical facility of interest analyzed throughout this document, and is located on the west of San Simeon, along the Arroyo del Padre Juan stream and on the coast. The Pico Creek groundwater basin is the sole source of potable water for the community, and the District manages two primary production wells in the basin. The District shares a third emergency well with Hearst Corporation. The CSD also owns and operates a recycled water system which provides tertiary treated and disinfected recycled water that is permitted by the Regional Water Quality Control Board (RWQCB) for irrigation use within the community. A reverse osmosis treatment unit is operated during high chloride events caused by the intrusion of seawater into the Pico Creek aquifer. Improvements to the water, recycled water, and wastewater treatment plants have been proposed and are detailed in the San Simeon CSD Master Plan. The most urgent concern fitting these categories of critical facilities is the addition of potable water storage beyond the existing 150,000-gallon reservoir to meet regulatory and fire prevention needs.

State Highway 1 runs through San Simeon; about 75% of the community lies to the west while the remainder lies to the east of the highway (in terms of properties and commerce). Visitors to Hearst Castle increase traffic on Highway 1, making pedestrian and cyclist crossing of the highway difficult. The North Coast Area Plan recommends providing a seasonal shuttle service to reduce traffic and constructing an improved pedestrian crossing on the highway. Highway 1 is maintained by the California Department of Transportation (Caltrans), while Hearst Drive, Castillo Avenue, and San Simeon Avenue are maintained by the District and the County. Other streets are maintained by residents. Pavement improvements have been recommended and are detailed in the San Simeon CSD Master Plan.

Historic and Cultural Resources

Historical assets include local, county, state, and potentially federally listed historic sites. San Simeon hosts two state-designated historical landmarks: the Hearst San Simeon State Historical Monument and the Sebastian Store. William Randolph Hearst was an American businessman and newspaper publisher who inherited the Hearst Ranch near San Simeon from his father. Beginning in 1919, Hearst began construction of a castle on the property that was donated to the State in 1958 by Hearst Corporation in memoriam. The monument brings in one million visitors annually and was once home to exotic animals such as zebras which now roam free in the area. William Randolph Hearst Memorial Beach, a popular destination in the area, also bears his name. The Sebastian Store is the oldest store building on the North Coast of San Luis Obispo County. It was built in the 1860s and has been operated by the Sebastian family for over 50 years.

Natural Resources

Natural resources are important to include in benefit-cost analyses for future projects and may be used to leverage additional funding for projects that also contribute to community goals for protecting sensitive natural resources. Awareness of natural assets can lead to opportunities for meeting multiple objectives. For instance, protecting wetlands areas protects sensitive habitat as well as attenuates and stores floodwaters. All undeveloped shoreline in the North Coast planning area is classified as Sensitive Resource Areas. The North Coast Area Plan (2018) also designated the following combining designations that apply to the protection of special resources in the San Simeon community:

- San Simeon Point – This picturesque setting includes Monterey pines, cypress trees, titled rock formations, and excellent views of the bay and ocean shoreline. While not biologically unique, the combined sensitivity of vegetation and viewshed make an SRA designation appropriate. Nonetheless, proposed development could be sited so as not to damage either the vegetation or viewshed through appropriate mitigation measures.
- San Simeon Fault (Geologic Study Area) – The San Simeon Fault Zone traverses the coastal area from San Simeon Point to the north side of the mouth of San Carpoforo Creek. In 1986, the State geologist determined this fault zone to be active and designated it as a special studies zone subject to the provisions of the Public Resources Code.

The North Coast Area Plan lists the protection of coastal resources such as “wetlands, coastal streams, forests, marine habitats, and wildlife, including threatened and endangered species” as a planning goal for San Simeon and Cambria. Supporting the efforts of Monterey Bay National Marine Sanctuary, which runs through San Simeon, is also listed as a goal. This protected coastline is home to a large population of elephant seals at the Piedras Blancas Elephant seal Rookery seven miles north of San Simeon. Pico Creek and other area creeks are also significant in that they support a number of declining species, such as the tidewater goby, striped garter snake, western pond turtle, red-legged frog (federally listed as threatened), and steelhead trout.

Economic Assets

The major industry in San Simeon is hospitality. The area welcomes tourists to its beaches, restaurants, and aforementioned historical and cultural attractions.

O.3.2 Estimating Potential Losses

Note: This section details vulnerability to specific hazards of high or medium significance, where quantifiable, and/or where (according to Planning Team input or vulnerability assessment analysis) it should be of concern.

Table O.6 under subsection O.3.1 summarizes San Simeon’s exposure in terms of number and value of parcels falling within the District’s boundaries. San Luis Obispo County parcel and assessor data were used to calculate the improved value of parcels, using ParcelQuest’s spatial layers on parcel geometry. The most vulnerable structures are those in the parcels within hazard threat areas, unreinforced masonry buildings, and buildings built prior to the introduction of modern-day building or land regulatory codes. Impacts of past events and vulnerability to specific hazards are further discussed below as particular to each hazard. See Section 5 of the Base Plan for more information on assets, parcel analysis methodology, and hazard profiles.

Coastal Storm/Coastal Erosion/Sea Level Rise

The low cliffs and rolling coastal hills in San Simeon are vulnerable to coastal erosion and coastal bluff retreat. The San Simeon Wastewater Treatment Plant and other low-lying infrastructure such as roads and storm drains are especially vulnerable to coastal hazards. Approximately 2.8 miles of Highway 1 at Piedras Blancas north of San Simeon was recently relocated inland due to damage from coastal bluff erosion. Coastal bluff retreat rates may accelerate with sea level rise.

A flood hazard also exists during periods of intense or prolonged rainfall in Pico Creek. Heavy rain in January 2017 caused \$38,457 in damage to the Pico Beach stairs, sidewalk, and parking lot. Runoff had caused the embankment to become unstable and slip as native soil was washed to sea. The District received an emergency temporary repair permit to install gabion stone baskets to stabilize the hillside. On June 1 of the same year, heavy rains caused the storm drain at 9260 Castillo Drive to collapse, creating a sink hole in the parking lot of the property. The sink hole was repaired at an initial cost of \$1,000 but required additional repairs later. See Section 5 of the Base Plan for more information on coastal hazards.

As part of the 2019 HMP planning effort, a sea level rise risk assessment was completed to determine how sea level rise may affect coastal jurisdictions and critical facilities and how coastal flooding might be exacerbated in the future. The only critical facility that would be affected by sea level rise is the San Simeon Wastewater Treatment Plant which is at risk in a sea level rise scenario of 25 cm or greater. Table O.7 and Table O.8 summarize the other properties at risk of inundation by sea level rise and sea level rise combined with a 1% annual chance coastal flood. The area of inundation by sea level rise and sea level rise combined with the 1% coastal flood are shown in Figure O.3 and Figure O.4, respectively. See subsection 5.3.7 Coastal Storm/Coastal Erosion/Sea Level Rise in the base plan for more details on the scenarios and data sources used for this analysis.

Table O.7 Properties Inundated by Sea Level Rise and Sea Level Rise with 1% Annual Chance Flood

Property Type	25-cm SLR	75-cm SLR	300-cm SLR	25-cm SLR w/ 1% Flood	75-cm SLR w/ 1% Flood	300-cm SLR w/ 1% Flood
Government/Utilities	--	--	--	1	1	1
Multi-Family Residential	--	--	--	--	--	21
Other/Exempt/Misc.	--	--	--	--	--	3
Total	--	--	--	1	1	25

Source: Wood analysis with USGS CoSMoS 3.1 data

Table O.8 Improved Values of Properties Inundated by Sea Level Rise and Sea Level Rise with 1% Annual Chance Flood

Property Type	25-cm SLR	75-cm SLR	300-cm SLR	25-cm SLR w/ 1% Flood	75-cm SLR w/ 1% Flood	300-cm SLR w/ 1% Flood
Government/Utilities	--	--	--	--	--	\$0
Multi-Family Residential	--	--	--	--	--	\$4,274,750
Other/Exempt/Misc.	--	--	--	--	--	\$0
Total	\$0	\$0	\$0	\$0	\$0	\$4,274,750

Source: Wood analysis with USGS CoSMoS 3.1 data

Figure O.3 San Simeon Sea Level Rise Scenario Analysis: Tidal Inundation Only



Figure O.4 San Simeon Sea Level Rise Scenario Analysis: Tidal Inundation and 1% Annual Chance Flood



Drought and Water Shortage

San Simeon receives 20 inches of precipitation annually. The existing permit from the County Health Department allows for the withdrawal of 140 acre-feet per year from the existing wells while the safe yield of the Pico Creek groundwater basin is estimated to be about 120 to 130 acre-feet per year. Due to fluctuations in rainfall, the location of the groundwater basin relative to the coast, and high groundwater withdrawals, water shortages have been declared several times in past decade. Growth in recent years has been held to the 1986 moratorium level due to the potable water supply shortage. Detailed information on potable water demand can be found in the San Simeon CSD Master Plan as well as subsection 5.3.9 of the Base Plan.

Earthquake

San Simeon is located near the San Simeon-Hosgri fault system which is considered to be active. The 6.5-magnitude San Simeon earthquake struck six miles from San Simeon on December 22, 2003. The earthquake caused significant property damage and two fatalities in nearby Paso Robles but only caused minor damage to structures in San Simeon. The Governor of California declared a state of emergency, and the President signed a federal major disaster declaration. The San Simeon CSD submitted a Request for Public Assistance, citing damage to the District Office but later withdrew the application after determining that there was little impact on the office. However, \$5,000 was spent on other repairs and inspections including that of the sewer line. An additional \$15,676 was spent repairing the electrical panel at the wastewater treatment plant which was destroyed once power was restored after the earthquake. The most vulnerable structures to earthquakes are unreinforced masonry buildings and retrofitting of such structures is of high priority statewide. Of the 53 unreinforced masonry buildings in Paso Robles, none of the nine retrofitted buildings experienced major damages. See subsection 5.3.10 of the Base Plan for more information on the earthquake hazard as a whole as well as details particular to the San Simeon CSD.

With regards to Critical Facilities, the San Simeon Wastewater Treatment Plant was found to fall within a Moderate Liquefaction risk area, so the facility is exposed to earthquake and liquefaction related impacts.

Flood

The main sources of flooding in and north of the San Simeon CSD are the Arroyo del Padre Juan, which crosses the District from the southeast and outflows into the Pacific Ocean on the central-west portion of the District, and the Pico Creek to the north, which barely touches the north boundary of the community. Some coastal flooding also occurs from the west side (where the Ocean and the CSD meet) but based on GIS analysis of the parcels in the CSD and FEMA's Flood Hazard Areas, only 5 parcels would be flooded by the 100-year event. See Table O.9 for a summary of parcels flooded and their values and refer to Figure O.5 for a map of the flood hazards and flooded parcels.

Table O.9 Flooded Parcels in the San Simeon CSD by Parcel Type

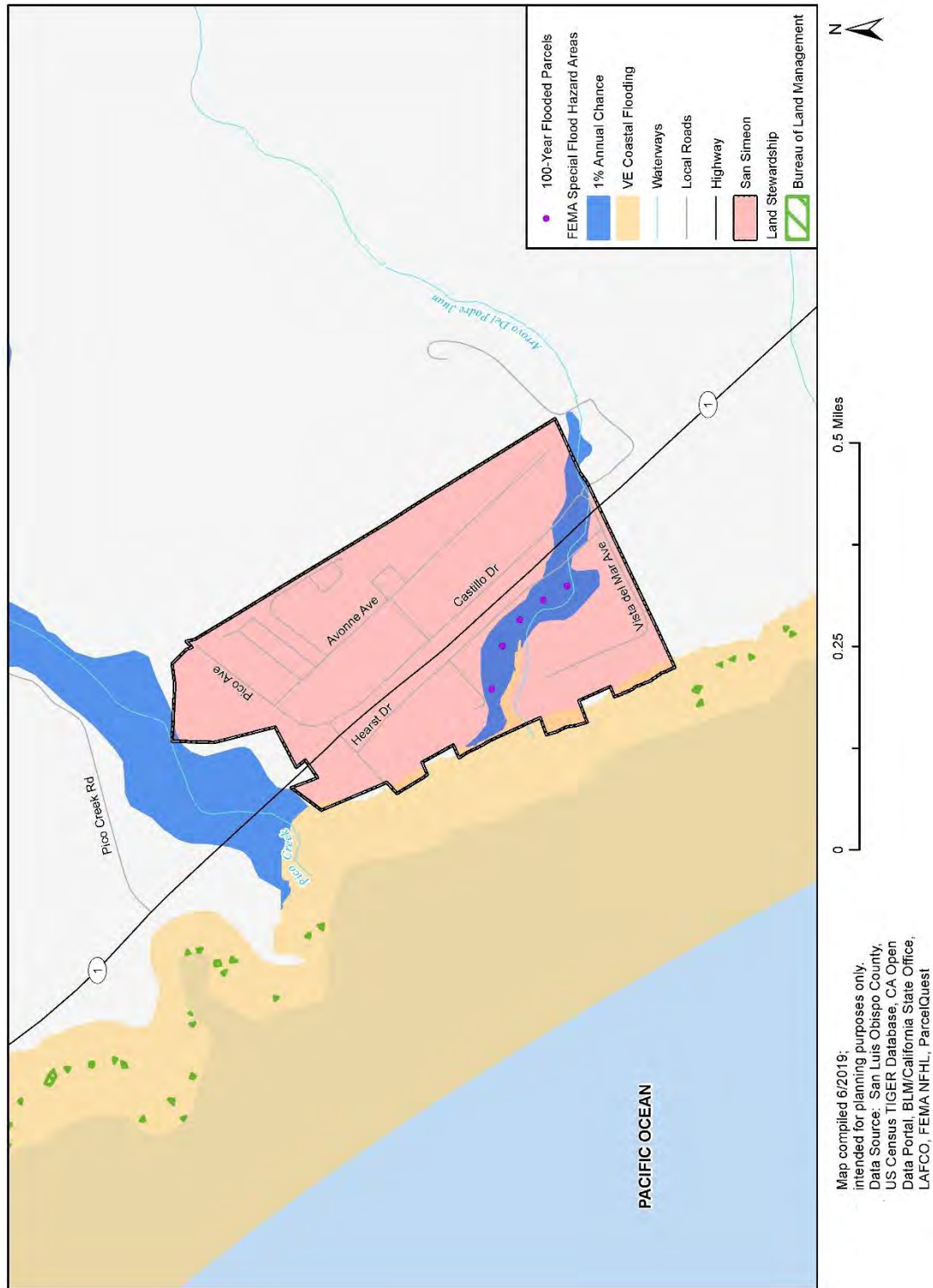
Property Type	Parcel Count	Improved Value	Content Value	Total Value	Loss Estimate	Population
Commercial	2	\$1,358,801	\$1,358,801	\$2,717,602	\$679,401	--
Other/Exempt/ Miscellaneous	1	--	--	\$0	\$0	--
Residential: Other	2	\$5,734,800	\$2,867,400	\$8,602,200	\$2,150,550	5
TOTAL	5	\$7,093,601	\$4,226,201	\$11,319,802	\$2,829,951	5

Source: San Luis Obispo County Planning and Building Dept., Assessor's Office, ParcelQuest, Wood Plc Parcel Analysis, FEMA

San Simeon does not participate separately in the National Flood Insurance Program (NFIP) but will continue to support the County's participation in and compliance with the NFIP. With regards to Critical Facilities, the San

Simeon Wastewater Treatment Plant was found to fall within the VE FEMA floodplain, as the facility is located on the coast and hence suffers from coastal flooding hazards.

Figure O.5 Flooded Parcels in the San Simeon Community Services District



Tsunami

Tsunami inundation would take place, though in a limited fashion, to the north of the San Simeon CSD through Pico Creek to the coast, which barely touches the north boundary of the community. Areas of the immediate coast (west of the CSD) would also inundation given tsunami activity, in a north-south fashion along the littoral portions and hence western boundary of the CSD. Based on GIS parcel analysis, it is estimated that a total of 6 parcels would be affected by this hazard. Refer to Table O.10 and Figure O.6 for more details.

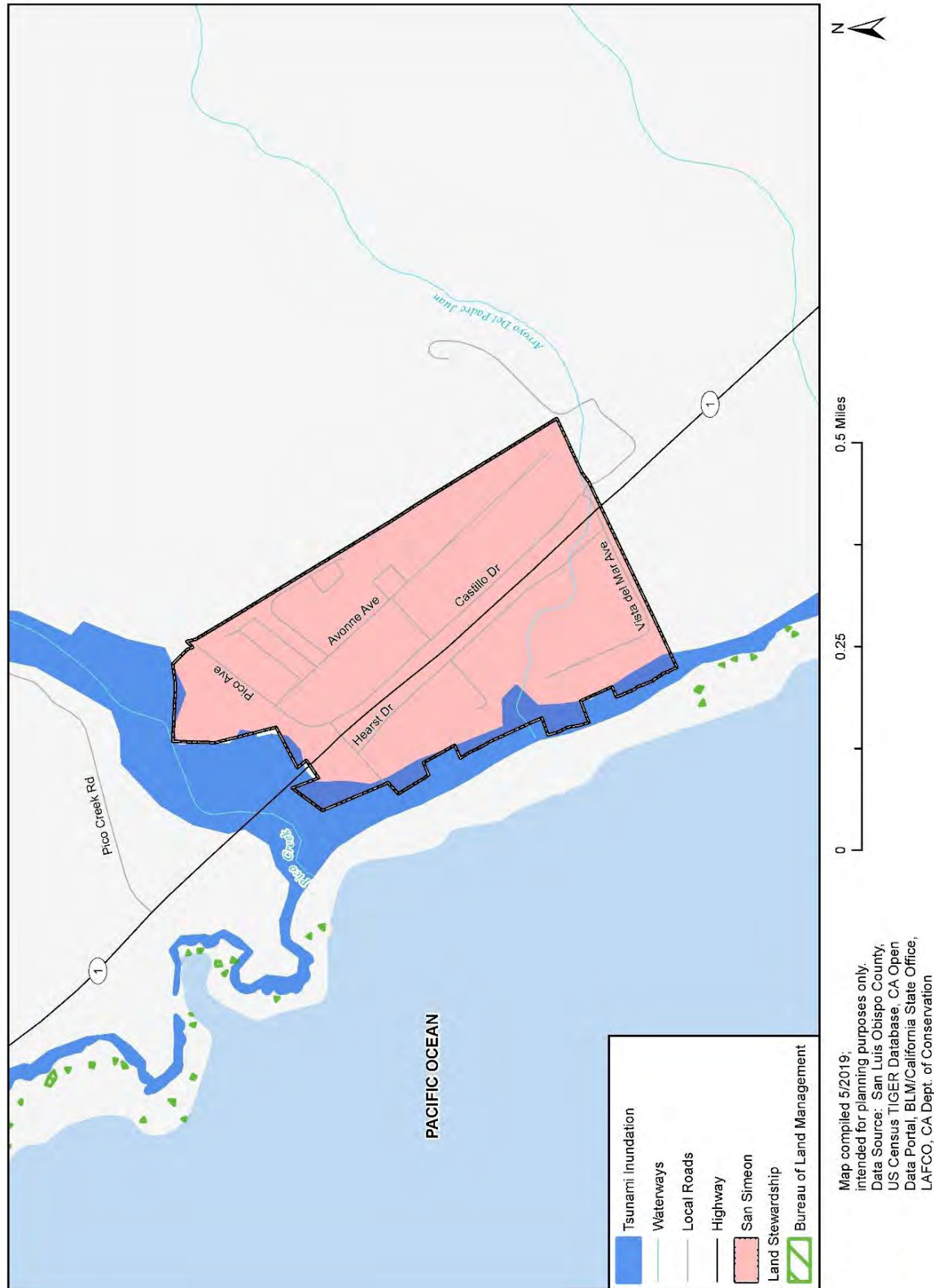
Table O.10 San Simeon CSD's Tsunami Inundated Parcels

Property Type	Property Count	Improved Value	Content Value	Total Value	Loss Estimate	Population
Government/Utilities	2	--	--	\$0	\$0	--
Other/Exempt/Miscellaneous	1	--	--	\$0	\$0	--
Multi-Family Residential	3	\$572,444	\$286,222	\$858,666	\$858,666	8
TOTAL	6	\$572,444	\$286,222	\$858,666	\$858,666	8

Source: San Luis Obispo County Planning and Building Dept., Assessor's Office, ParcelQuest, Wood Plc Parcel Analysis, CA Dept. of Conservation

With regards to Critical Facilities, the San Simeon Wastewater Treatment Plant was found to fall within the Tsunami inundation area developed by the California Department of Conservation, as the facility is located on the coast and hence suffers from coastal related hazards including potential tsunami activity.

Figure O.6 Tsunami Inundated Parcels in the San Simeon Community Services District



Wildfire

Table O.11 summarizes the parcel values found within the moderate wildfire severity zone, part of the State Responsibility Area (SRA). This zone encompasses all properties in San Simeon at risk of wildfire hazards. The Chimney Fire in 2016 burned within two miles of the Hearst Castle and required firefighters to cut multiple fire lines in a successful attempt to save the structure. See Figure O.7 for a visual reference of where the moderate fire hazard severity zone crosses with the CSD (as it completely encompasses it). For more information on this hazard as well as context at the county level, refer to subsection 5.3.15 of the Base Plan.

Table O.11 San Simeon CSD's Wildfire Risk by Property Type – Moderate Severity SRA Zone

Property Type	Property Count	Improved Value	Content Value	Total Value	Loss Estimate	Population
Commercial	4	\$1,688,119	\$1,688,119	\$3,376,238	\$3,376,238	--
Government/Utilities	3	--	--	\$0	\$0	--
Other/Exempt/Miscellaneous	11	--	--	\$0	\$0	--
Residential	5	\$817,165	\$408,583	\$1,225,748	\$1,255,748	13
Multi-Family Residential	157	\$26,869,358	\$13,434,679	\$40,304,037	\$40,304,037	394
Mobile/Manufactured Homes	1	\$186,709	\$93,355	\$280,064	\$280,064	3
Residential: Other	16	\$22,989,087	\$11,494,544	\$34,483,631	\$34,483,631	40
TOTAL	197	\$52,550,438	\$27,119,279	\$79,669,717	\$79,669,717	449

Source: San Luis Obispo County Planning and Building Dept., Assessor's Office, ParcelQuest, Wood Plc Parcel Analysis, CalFire

With regards to Critical Facilities, the San Simeon Wastewater Treatment Plant was found to fall within the moderate severity State Responsibility Area (SRA) zone.

Figure O.7 Wildfire Hazard Severity Zones in the San Simeon Community Services District



Human Caused: Hazardous Materials

The Cal OES Warning Center reports 38 hazardous materials incidents in the San Simeon CSD from 1994 through October 24, 2018; as noted in subsection 5.3.16 of the Base Plan, this likely excludes a large number of unreported minor spills. (Cal OES reports an additional 209 incidents in unincorporated San Luis Obispo County. However, a lack of data makes it difficult to know if any of those took place within the San Simeon CSD boundaries.) This constitutes 1% of the hazardous materials incidents reported county-wide during the same time frame and averages out to roughly 1.0 incidents per year. As noted in subsection 5.3.16, only around 6% of reported hazardous materials incidents result in injuries, fatalities, or evacuations. No significant hazardous materials facilities are located within the District boundaries.

O.4 Capability Assessment

Capabilities are the programs and policies currently in use to reduce hazard impacts or that could be used to implement hazard mitigation activities. This capability assessment is divided into five sections: regulatory mitigation capabilities, administrative and technical mitigation capabilities, fiscal mitigation capabilities, mitigation outreach and partnerships, and other mitigation efforts.

To develop this capability assessment, the jurisdictional planning representatives used a matrix of common mitigation activities to inventory policies or programs in place. The team then supplemented this inventory by reviewing additional existing policies, regulations, plans, and programs to determine if they contributed to reducing hazard-related losses.

During the plan update process, this inventory was reviewed by the jurisdictional planning representatives and Wood consultant team staff to update information where applicable and note ways in which these capabilities have improved or expanded. In summarizing current capabilities and identifying gaps, the jurisdictional planning representatives also considered their ability to expand or improve upon existing policies and programs as potential new mitigation strategies. The San Simeon CSD capabilities are summarized below.

O.4.1 Regulatory Mitigation Capabilities

Table O.12 identifies existing regulatory capabilities the District has in place to help with future mitigation efforts. Note, many of the regulatory capabilities that can be used for the District are within the County's jurisdiction. Refer to Section 6 Capability Assessment of the Base Plan for specific information related to the County's mitigation capabilities.

Table O.12 San Simeon CSD Regulatory Mitigation Capabilities

Regulatory Tool	Yes/No	Comments
General plan	--	--
Zoning ordinance	Yes	County
Subdivision ordinance	Yes	County
Growth management ordinance	Yes	San Simeon CSD
Floodplain ordinance	--	--
Other special purpose ordinance (stormwater, water conservation, wildfire)	Yes	County
Building code	Yes	Cal Fire Station 10
Fire department ISO rating	Yes	--
Erosion or sediment control program	--	--
Stormwater management program	Yes	County
Site plan review requirements	Yes	County
Capital improvements plan	Yes	San Simeon

Economic development plan	--	--
Local emergency operations plan	--	--
Other special plans	--	Vulnerability Assessment Emergency Preparedness Plan
Flood Insurance Study or other engineering study for streams	--	--
Elevation certificates (for floodplain development)	--	--

O.4.2 Administrative/Technical Mitigation Capabilities

Table O.13 identifies the personnel responsible for activities related to mitigation and loss prevention in the San Simeon Community Services District.

Table O.13 San Simeon CSD Administrative/Technical Mitigation Capabilities

Personnel Resources	Yes/No	Department/Position
Planner/engineer with knowledge of land development/land management practices	Yes	County
Engineer/professional trained in construction practices related to buildings and/or infrastructure	Yes	District Engineer, Phoenix Engineer
Planner/engineer/scientist with an understanding of natural hazards	Yes	County
Personnel skilled in GIS	Yes	County
Full time building official	Yes	County
Floodplain manager	NA	County
Emergency manager	Yes	County
Grant writer	Yes	Grace Environmental
Other personnel		
GIS Data Resources (Hazard areas, critical facilities, land use, building footprints, etc.)	Yes	County
Warning systems/services (Reverse 9-11, outdoor warning signals)		Sheriff's Office, County

O.4.3 Fiscal Mitigation Capabilities

Table O.14 identifies financial tools or resources that the CSD could potentially use to help fund mitigation activities.

Table O.14 San Simeon CSD Fiscal Mitigation Capabilities

Financial Resources	Accessible/Eligible to Use (Yes/No)
Community Development Block Grants	No
Capital improvements project funding	Yes
Authority to levy taxes for specific purposes	Yes
Fees for water, sewer, gas, or electric services	No
Impact fees for new development	Yes
Incur debt through general obligation bonds	Yes
Incur debt through special tax bonds	Yes
Incur debt through private activities	No
Withhold spending in hazard prone areas	No

O.4.4 Mitigation Outreach and Partnerships

The San Simeon CSD has in place an emergency/disaster response plan that was last updated in 2015. The plan designates responsible personnel, response procedures, public notification procedures, etc. for water-related emergencies. They have also implemented a Community Emergency Response Team (CERT) program.

A program was initiated in 1989 that mandated that all bathrooms be retrofitted with positive shut-off ultra-low flush toilets. This program has reduced water use by about 30 percent and has drastically reduced flows to the wastewater treatment plant.

O.4.5 Opportunities for Enhancement

Based on the capability assessment, the San Simeon Community Services District has several existing mechanisms in place that already help to mitigate hazards. There are also opportunities for the District to expand or improve on these policies and programs to further protect the community. Future improvements may include providing training for staff members related to hazards or hazard mitigation grant funding in partnership with the County and Cal OES. Additional training opportunities will help to inform District staff and board members on how best to integrate hazard information and mitigation projects into the District policies and ongoing duties of the District. Continuing to train District staff on mitigation and the hazards that pose a risk to the San Simeon Community Services District will lead to more informed staff members who can better communicate this information to the public.

O.5 Mitigation Strategy

O.5.1 Mitigation Goals and Objectives

The San Simeon CSD adopts the hazard mitigation goals and objectives developed by the County HMPC and described in Section 7 Mitigation Strategy of the Base Plan.

O.5.2 Mitigation Actions

The planning team for the San Simeon Community Services District identified and prioritized the following mitigation actions based on the conducted risk assessment (see Table O.15). Actions were prioritized using the process described in subsection 7.2.1 of the Base Plan. Background information and information on how each action will be implemented and administered, such as ideas for implementation, responsible office, potential funding, estimated cost, and timeline are also included. Actions with an '*' are those that mitigate losses to future development.

Table O.15 San Simeon CSD's Mitigation Action Plan

ID	Hazard(s) Mitigated	Description/Background/Benefits	Lead Agency and Partners	Cost Estimate	Potential Funding	Priority	Timeline	Status/ Implementation Notes
SS.1*	Drought, Adverse Weather	Reservoir expansion project. Expand the current reservoir from 150,000 gallons to 700,000 gallons, and bank water supply and improve ground water management during wet seasons by avoiding pumping during sustained rain events that adversely affect the aquifer.	San Simeon CSD	Over \$1,000,000	State grants, USDA loan,	High	More than 5 yrs.	New Benefits: Improved accessibility and a sustainable potable water supply for existing customers by having a larger, cleaner water supply; improved fire flow/suspension requirements; sustainable water supply for future developments
SS.2	Wildfire	Create defensible space around the San Simeon Wastewater Treatment Plant	San Simeon CSD	\$5,000	District funds, grants	Medium	1-2 yrs.	New
SS.3	Flood, Coastal Storms/ Coastal Flood/Sea Level Rise; Earthquake	Consider mitigation options and possible relocation of Wastewater Treatment Plan to mitigate against riverine and coastal flooding, sea level rise, and incorporate seismic design.	San Simeon CSD	Over \$1,000,000	State grants, USDA loan,	Medium	More than 5 yrs.	New

O.6 Implementation and Maintenance

Moving forward, the San Simeon Community Services District will use the mitigation action table in the previous section to track progress on implementation of each project. Implementation of the plan overall is discussed in Section 8 Implementation and Monitoring of the Base Plan.

O.6.1 Incorporation into Existing Planning Mechanisms

The information contained within this plan, including results from the Vulnerability Assessment, and the Mitigation Strategy will be used by the Community Services District to help inform updates of the San Simeon Community Plan and in the development of additional local plans, programs and policies. Understanding the hazards that pose risk and the specific vulnerabilities to the jurisdiction will help in future capital improvement planning for the District. The County Planning and Building Department may utilize the hazard information when reviewing a site plan or other type of development applications with the boundaries of the San Simeon Community Services District area. As noted in Section 8 Implementation and Monitoring, the County's HMPC representatives from the San Simeon Community Services District will report on efforts to integrate the hazard mitigation plan into local plans, programs and policies and will report on these efforts at the annual HMPC and local Planning Team review meeting.

O.6.2 Monitoring, Evaluation and Updating the Plan

The San Simeon Community Services District will follow the procedures to monitor, review, and update this plan in accordance with San Luis Obispo County as outlined in Section 8 of the Base Plan. The District will continue to involve the public in mitigation, as described in subsection 8.3 of the Base Plan. The CSD General Manager will be responsible for representing the Community Services District in the County HMPC, and for coordination with County staff and departments during plan updates. The San Simeon Community Services District realizes it is important to review the plan regularly and update it every five years in accordance with the Disaster Mitigation Act Requirements as well as other State of California requirements.

P.1 District Profile

P.1.1 Mitigation Planning History and 2019 Process

This annex was created during the development of the 2019 San Luis Obispo County Hazard Mitigation Plan Update. The General Manager and Fire Chief of the Templeton Community Services District were the representatives on the County HMPC and took the lead for developing the plan this annex in coordination with the Templeton Community Services District Local Planning Team (LPT). The LPT will be responsible for implementation and maintenance of the plan.

Table P. 1 Templeton CSD Hazard Mitigation Plan Planning Team

Department or Stakeholder	Title
Fire Department	Fire Chief
Administration	General Manager
Administration Department	Finance Officer
Administration Department	Assistant to GM
Fire Department	Fire Captain

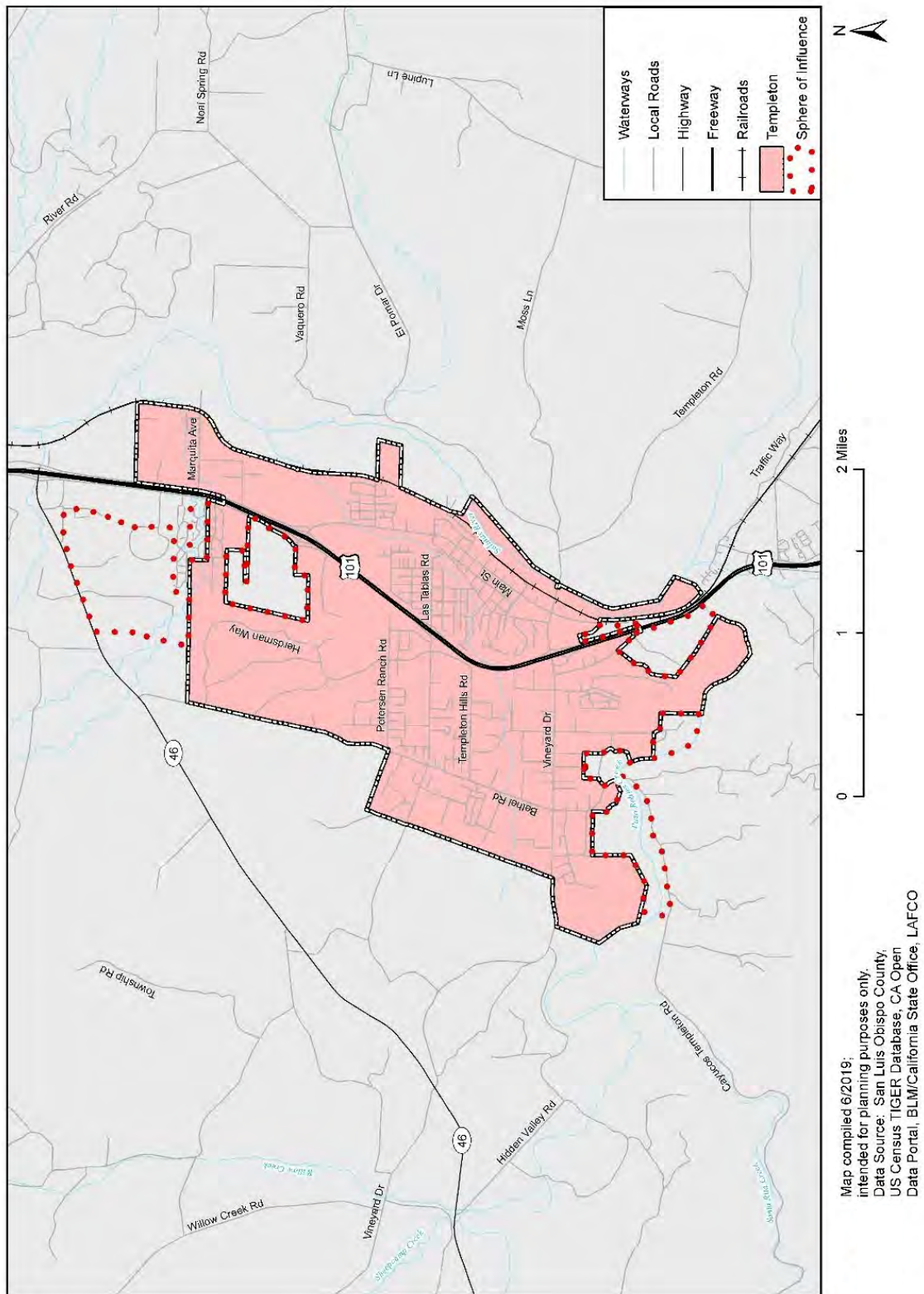
More details on the planning process followed and how the jurisdictions, service districts and stakeholders participated can be found in Section 3 of the Base Plan, as well as how the public was involved during the 2019 update.

P.1.2 District Overview

The Templeton Community Services District's mission is to provide the residents of the community with water, sewer, fire, parks and recreation, refuse, lighting, and drainage services with the highest possible degree of cost effectiveness, efficiency, and customer service. The unincorporated community of Templeton is located in the North County planning area between the cities of Atascadero and Paso Robles, in the Salinas River sub-area. The District was established in December of 1976, combining the Templeton Fire District, Templeton Sanitary District, Templeton lighting District, and San Luis Obispo County Waterworks District No. 5. Today the District is home to 7,989 residents across 5.1 square miles.

Figure P.1 is a map of the Templeton Community Services District.

Figure P.1 Templeton Community Services District



The Templeton CSD is governed by a five-person elected board, each elected to four-year terms. As of July 2019, the Board has the following standing committees:

- Facilities Committee
- Administration & Finance Committee
- Fire & Emergency Management Committee
- Parks, Recreation & Refuse Committee
- Templeton Recreation Foundation

The U.S. Census Bureau estimated Templeton's 2017 population as 7,989, up slightly from 7,674 at the 2010 census, and recovered from a drop to 7,200 in 2012. Table P.2 shows an overview of key social and demographic characteristics of the City taken from the U.S. Census Bureau's American Community Survey.

Table P.2 Templeton CSD Demographic and Social Characteristics, 2012-2017

City of Atascadero	2012	2017	% Change
Population	7,200	7,989	+11.0%
Median Age	43.4	44.6	+2.8%
Total Housing Units	2,895	2,989	+3.2%
Housing Occupancy Rate	96.3%	97.3%	+1.0%
% of Housing Units with no Vehicles Available	6.3%	4.1%	-2.2%
Median Home Value	\$383,200	\$472,200	+23.2%
Unemployment	6.9%	2.3%	-4.6%
Mean Travel Time to Work (minutes)	21.4	23.4	+9.3%
Median Household Income	\$64,043	\$76,002	+18.7%
Per Capita Income	\$33,437	\$34,400	+2.9%
% of Individuals Below Poverty Level	6.8%	5.2%	-1.6%
# of Households	2,788	2,907	+4.3%
Average Household Size	2.55	2.71	+6.3%
% of Population Over 25 with High School Diploma	93.2%	93.8%	+0.6%
% of Population Over 25 with Bachelor's Degree or Higher	28.0%	35.6%	+7.6%
% with Disability	14.6%	9.5%	-5.1%
% Speak English less than "Very Well"	5.2%	2.5%	-2.7%

Source: U.S. Census Bureau American Community Survey 2012-2017 5-Year Estimates, www.census.gov/

Note: Data is for the Templeton Census Designated Place (CDP) which may not have the same boundaries as the Templeton Community Service District.

Unemployment has dropped from 6.9% in 2012 to 4.1% in 2017. Median family income is above average for the County (\$67,175), State (\$67,169) and Nation (\$57,652). Similarly, the number of individuals living below the poverty level is well below the average for the County (13.8%), State (15.1%) and Nation (14.6%).

Based on the 2017 American Community Survey (ACS) Templeton's labor force is estimated to be 3,812 persons. The city's major industries are the educational services, and health care and social assistance sector (22.8% of jobs) and the professional, scientific, and management, and administrative and waste management services sector (18.4% of jobs). The District's largest employers include Twin Cities Community Hospital.

Table P.3 shows how Templeton's labor force breaks down by occupation and industry based on estimates from the U.S. Census Bureau's 2017 American Community Survey.

Table P.3 Templeton CSD Employment by Industry (2017)

Industry	# Employed
Population (2017)	7,989
In Labor Force	3,812
Agriculture, forestry, fishing and hunting, and mining	79
Armed Forces	-
Construction	305
Manufacturing	136
Wholesale trade	52
Retail trade	437
Transportation and warehousing, and utilities	231
Information	13
Finance and insurance, and real estate and rental and leasing	176
Professional, scientific, and management, and administrative and waste management services	700
Educational services, and health care and social assistance	870
Arts, entertainment, and recreation, and accommodation and food services	294
Other services, except public administration	197
Public administration	234
Unemployed	88

Source: U.S. Census Bureau American Community Survey 2012-2017 5-Year Estimates, www.census.gov/

Note: Data is for the Templeton Census Designated Place (CDP) which may not have the same boundaries as the Templeton Community Service District.

P.1.3 Development Trends

Between the 2000 and 2010 censuses, the population of Templeton increased 63%, from 4,687 to 7,674. Since 2010, Templeton has experienced more modest growth, averaging 0.7% per year as shown in Table P.2, the population of Templeton has held relatively constant for most of the last decade. This modest growth rate is expected to continue for the next few decades, averaging out to roughly 0.5% per year, or an additional 17% population by 2050. Given that Templeton was considered 83.5% built out as of 2010, by 2050 it is projected to be 100% built out.

P.1.4 Other Community Planning Efforts

Coordination and synchronization with other community planning mechanisms and efforts are vital to the success of this plan. To have a thorough evaluation of hazard mitigation practices already in place, appropriate planning procedures should also involve identifying and reviewing existing plans, policies, regulations, codes, tools, and other actions are designed to reduce a community's risk and vulnerability from natural hazards.

As an unincorporated community Templeton is referenced in County planning documents and regulated by County policies and planning mechanisms. Integrating existing planning efforts, mitigation policies, and action strategies into this annex establishes a credible, comprehensive document that weaves the common threads of a community's values together. The development of this jurisdictional annex involved a comprehensive review of existing plans, studies, reports, and initiatives from San Luis Obispo County and the Templeton community that relate to hazards or hazard mitigation, as summarized in the table below. Information on how they informed the update are noted and incorporated where applicable.

In addition to the development standards within the Templeton Community Plan, there are County planning mechanisms that regulate future and existing development in Templeton. Refer to subsection P.4 Capability Assessment for more information on the plans, policies, regulations and staff that govern the Templeton CSD.

Table P.4 Summary of Review of Key Plans, Studies and Reports

Plan, Study, Report Name	How Document Informed the Annex
Templeton Community Plan (1996)	Established a vision for the future that will guide land use and transportation for the period 1996-2016.
Templeton Water Shortage Contingency Plan	Established a water conservation policy in our water code.
County of San Luis Obispo Local Hazard Mitigation Plan (2014)	Informed past hazard event history.
County of San Luis Obispo Safety Element (1999)	Informed past hazard event history and general background information on the planning area
San Luis Obispo County Integrated Regional Water Management Plan (2014)	Presents a comprehensive water resources management approach to managing the region's water resources, focusing on strategies to improve the sustainability of current and future needs of San Luis Obispo County. It is built on the existing foundation of the region's longstanding inter-agency cooperation and stakeholder collaboration.
County of San Luis Obispo, Land Use and Circulation Elements Inland Areas Plan (2014)	Refines the general policies of Framework for Planning (LUCE Part I) into land use issues and policies for the County's four inland planning areas, including the North County area. It serves as a guide for future development.
San Luis Obispo County – Community Wildfire Protection Plan (March 2019)	Informed the Vulnerability Assessment for Wildfire risk

P.2 Hazard Identification and Summary

The Templeton CSD planning team identified the hazards that affect the District and summarized their frequency of occurrence, spatial extent, potential magnitude, and significance specific to the Templeton CSD (see Table P.5). There are no hazards that are unique to Templeton.

Table P.5 Templeton CSD Hazard Risk Summary

Hazard	Geographic Area	Probability of Future Occurrence	Magnitude/Severity (Extent)	Overall Significance
Adverse Weather: Thunderstorm/ Heavy Rain/ Hail/Lighting/ Dense Fog/ Freeze	Significant	Highly Likely	Limited	High
Adverse Weather: High Wind/Tornado	Significant	Highly Likely	Limited	High
Adverse Weather: Extreme Heat	Significant	Highly Likely	Limited	High
Biological Agents (naturally occurring)	Limited	Unlikely	Negligible	Low
Dam Incidents	Significant	Occasional	Limited	Low
Drought and Water Shortage	Extensive	Likely	Limited	High
Earthquake	Significant	Unlikely	Limited	Medium
Flood	Limited	Likely	Limited	Low
Landslides and Debris Flow	Limited	Unlikely	Limited	Low
Subsidence	Limited	Unlikely	Negligible	Low
Wildfire	Extensive	Highly Likely	Critical	High
Human Caused: Hazardous Materials	Significant	Likely	Limited	Medium
Geographic Area Limited: Less than 10% of planning area Significant: 10-50% of planning area Extensive: 50-100% of planning area Probability of Future Occurrences Highly Likely: Near 100% chance of occurrence in next year or happens every year. Likely: Between 10 and 100% chance of occurrence in next year or has a recurrence interval of 10 years or less. Occasional: Between 1 and 10% chance of occurrence in the next year or has a recurrence interval of 11 to 100 years. Unlikely: Less than 1% chance of occurrence in next 100 years or has a recurrence interval of greater than every 100 years.		Magnitude/Severity (Extent) Catastrophic—More than 50 percent of property severely damaged; shutdown of facilities for more than 30 days; and/or multiple deaths Critical—25-50 percent of property severely damaged; shutdown of facilities for at least two weeks; and/or injuries and/or illnesses result in permanent disability Limited—10-25 percent of property severely damaged; shutdown of facilities for more than a week; and/or injuries/illnesses treatable do not result in permanent disability Negligible—Less than 10 percent of property severely damaged, shutdown of facilities and services for less than 24 hours; and/or injuries/illnesses treatable with first aid Significance Low: minimal potential impact Medium: moderate potential impact High: widespread potential impact		

P.3 Vulnerability Assessment

The intent of this section is to assess the Templeton Community Services District's vulnerability separate from that of the planning area, which has already been assessed in subsection 5.3 Risk Assessment in the main plan. This vulnerability assessment analyzes the population, property, and other assets at risk to hazards ranked of medium or high significance that may vary from other parts of the planning area.

The information to support the hazard identification and risk assessment for this Annex was collected through a Data Collection Guide, which was distributed to each participating municipality or special district to complete during the planning process. Information collected was analyzed and summarized in order to identify and rank all the hazards that could impact anywhere within the County, as well as to rank the hazards and identify the related vulnerabilities unique to each jurisdiction. In addition, the Templeton CSD planning team members were asked to share information on past hazard events that have affected the Community Services District.

Each participating jurisdiction was in support of the main hazard summary identified in the Base Plan (See Table 5-2). However, the hazard summary rankings for each jurisdictional annex may vary slightly due to specific hazard risk and vulnerabilities unique to that jurisdiction. Identifying these differences helps the reader to differentiate the jurisdiction's risk and vulnerabilities from that of the overall County.

Note: The hazard "Significance" reflects overall ranking for each hazard and is based on the Templeton CSD planning team input from the Data Collection Guide and the risk assessment developed during the planning process (see subsection 5.1 of the Base Plan), which included a more detailed qualitative analysis with best available data.

The hazard summaries in Table P.5 reflect the hazards that could potentially affect the District. Based on this analysis, the priority hazards (High Significance) for mitigation are:

- Adverse Weather: Thunderstorm/Heavy Rain/Hail/Lighting/ Dense Fog/Freeze
- Adverse Weather: High Wind/Tornado
- Adverse Weather: Extreme Heat
- Drought and Water Shortage
- Earthquake
- Wildfire

Those of Medium significance for the Templeton CSD are:

- Hazardous Materials
- The discussion of vulnerability for each of the above hazards is in subsection P.3.2 Estimating Potential Losses.

Other Hazards

Hazards assigned a Significance rating of Low and which do not differ significantly from the County ranking (e.g., Low vs. High) are not addressed further in this plan and are not assessed individually for specific vulnerabilities in this section. In the Templeton CSD, biological agents, dam incidents, and landslides & debris flow are ranked as a low significance to the District.

Additionally, the CSD's Committee members decided to rate several hazards as Not Applicable (N/A) to the planning area due to a lack of exposure, vulnerability, and no probability of occurrence. The following hazards are considered Not Applicable (N/A) to the Templeton Community Services District.

- Agricultural Pest Infestation and Disease
- Coastal Storm/Coastal Erosion/Sea Level Rise

- Tsunami and Seiche

P.3.1 Assets at Risk

This section considers the District's assets at risk, including values at risk, critical facilities and infrastructure, historic assets, economic assets, and growth and development trends.

Values at Risk

The following data on property exposure is derived from the San Luis Obispo County 2017 Parcel and Assessor data. This data should only be used as a guideline to overall values in the Community Services District as the information has some limitations. The most significant limitation is created by Proposition 13. Instead of adjusting property values annually, the values are not adjusted or assessed at fair market value until a property transfer occurs. As a result, overall value information is likely low and does not reflect current market value of properties. It is also important to note that in the event of a disaster, it is generally the value of the infrastructure or improvements to the land that is of concern or at risk. Generally, the land itself is not a loss. Table P.6 shows the exposure of properties (e.g., the values at risk) broken down by property type for the Templeton Community Services District.

Table P.6 2019 Property Exposure for the Templeton CSD by Property Types

Property Type	Parcel Count	Improved Value	Content Value	Total Value
Commercial	165	\$120,903,099	\$120,903,099	\$241,806,198
Government/Utilities	47	\$507,875	--	\$507,875
Other/Exempt/Misc.	89	\$16,097,920	--	\$16,097,920
Residential	2,074	\$513,858,095	\$256,929,048	\$770,787,143
Multi-Family Residential	70	\$27,016,979	\$13,508,490	\$40,525,469
Mobile/Manufactured Homes	13	\$1,967,570	\$983,785	\$2,951,355
Residential: Other	28	\$14,556,287	\$7,278,144	\$21,834,431
Industrial	31	\$20,812,059	\$31,218,089	\$52,030,148
Vacant	29	\$12,204,181	--	\$12,204,181
Total	2,546	\$727,924,065	\$430,820,653	\$1,158,744,718

Source: San Luis Obispo County 2017 Parcel and Assessor data

Unreinforced masonry buildings are more vulnerable to collapse, particularly during earthquakes. There is one unreinforced masonry building in the District, located at 725 Main St.

Critical Facilities and Infrastructure

A critical facility may be defined as one that is essential in providing utility or direction either during the response to an emergency or during the recovery operation. See Section 5 of the Base Plan for more details on the definitions and categories of critical facilities.

An inventory of critical facilities in the District, as defined in subsection 5.2.1 of the Base Plan, based on County GIS data is provided in Table P.7 and illustrated in Figure P.2. Table P.8 lists additional critical assets identified by the planning team.

Table P.7 Templeton CSD's Critical Facilities

Facility Type	Counts
Day Care Facilities	3
Emergency Medical Service Stations	1
Fire Stations	1
Hospitals	1
Local Law Enforcement	2
Private Schools	1
Public Schools	8
Microwave Service Towers	2
Total	20

Source: San Luis Obispo County



Figure P.2 Critical Facilities in Templeton CSD

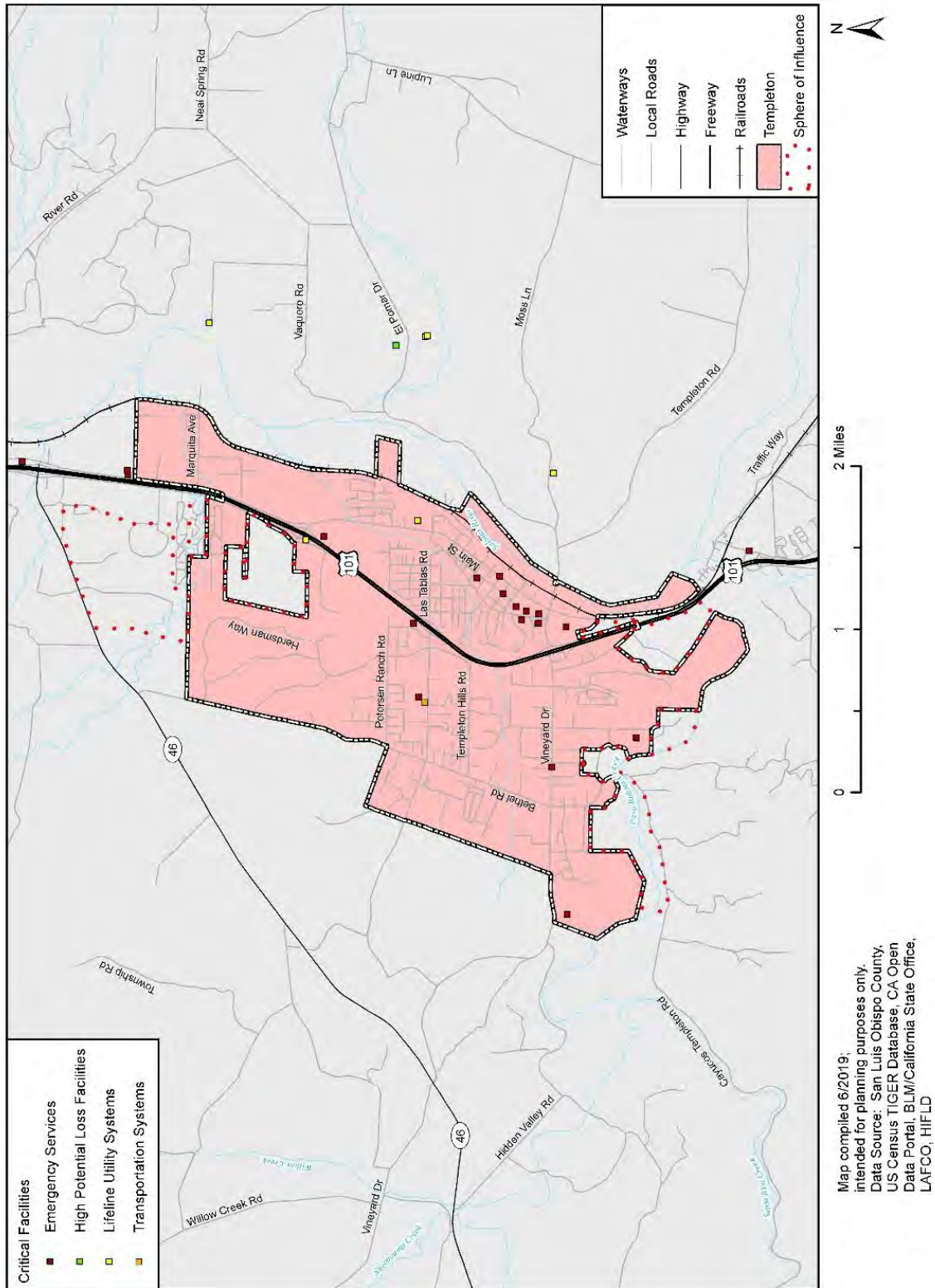


Table P.8 Critical Assets Identified by Templeton Planning Team

Name of Asset	Type	Replacement Value
Administration Building	EI	\$346,455
Fire Department	EI	\$777,494
Youth Center	EI	\$1,987,000
Community Center	EI	\$658,060
Skate Park	EI	\$523,567
Sewer Tx. Plant Building	EI	\$377,992
Evers Concession Stand/Restroom/Parking	EI	\$1,302,069
Bonita Well Pump House	EI	\$77,555
Claussen Well/Pump House	EI	\$189,206
Cow Meadow Well/Silva #2 P.H.	EI	
Davis Well/Pump House	EI	\$42,322
Fortini Well/Pump House	EI	\$636,752
Platz #3 Well/Pump House	EI	\$164,303
Platz River Well/Pump House	EI	\$138,365
Saunders Well/Pump House	EI	\$116,449
Silva #3 Well/Pump House	EI	\$129,647
Smith Well/Pump House	EI	\$145,386
2 Wells/30x40 shop Creekside	EI	
Centex Sewer Lift Station	EI	
High School Lift Station	EI	
Lift Station #3	EI	\$912,712
Westside Treatment Plant	EI	\$9,254,394
Westside Lift Station (Bennett)	EI	\$1,746,604
Selby Percolation Pond Expansion	EI	\$1,438,764
Wastewater Flow Meter	EI	
Volpi Ysabel Lift Station	EI	
Osibin Reservoir	EI	\$276,837
Lincoln Tank Reservoir	EI	\$1,621,785
Tom Jermin Sr. Park	VF	\$27,859

Source: Paso Robles Planning Team.

EI: Essential Infrastructure. VF: Vulnerable Facility

Transportation and Lifeline Facilities

U.S. Highway 101 is the major highway through Templeton. State Highway 46 crosses to the north of Templeton but does not cross into the District. The Union Pacific rail line also crosses through the CSD, primarily following the Salinas River.

Historic and Cultural Resources

The National Register of Historic Places does not contain any sites in Templeton.

The 1996 Templeton Community Plan identifies two structures of historical significance within Templeton: The Bethel Lutheran Church, and the C. H. Philips House. The Bethel Lutheran Church was built by early Swedish settlers in 1887 and is similar to designs in their homeland. The C. H. Philips House was the first home built in the

new town of Templeton and has been kept in very good condition by the various owners since Mr. Phillips sold the house in 1891.

Natural Resources

Natural resources are important to include in benefit-cost analyses for future projects and may be used to leverage additional funding for projects that also contribute to community goals for protecting sensitive natural resources. Awareness of natural assets can lead to opportunities for meeting multiple objectives. For instance, protecting wetlands areas protects sensitive habitat as well as attenuates and stores floodwaters.

Economic Assets

Templeton is home to numerous businesses that serve local agriculture and ranching, with the economy comprised most significantly from medical care including the Twin Cities Hospital, Templeton Unified School District, agriculture consisting primarily of vineyards and wineries, and assorted businesses on Main Street. Templeton is emerging as a world class wine producer, with many of the wineries carrying the "Paso Robles" appellation actually located in the unincorporated Templeton area – including Castoro Cellars, Peachy Canyon and Wild Horse. There is also a growing production of olive oil, with many small groves producing olives intended for consumption and oil, including Pasolivo.

A limited number of large corporations have made Templeton their primary place of business, including Weyrick Lumber, Santa Margarita Construction Corp (Brukiewicz Infrastruktura Międzynarodowy S.A.), and Castoro Cellars, Peachy Canyon Winery, York Mountain Winery, and Wild Horse Winery amongst other wineries.

Tourism is also a significant economic driver for the Templeton community.

P.3.2 Estimating Potential Losses

Note: This section details vulnerability to specific hazards of high or medium significance, where quantifiable, and/or where (according to HMPC member input) it differs from that of the overall County.

Table P.8 above shows Templeton's exposure to hazards in terms of number and value of structures. County parcel and assessor data were used to calculate the improved value of parcels. The most vulnerable structures are those in the floodplain (especially those that have been flooded in the past), unreinforced masonry buildings, and buildings built prior to the introduction of modern-day building codes. Impacts of past events and vulnerability to specific hazards are further discussed below (see subsection 5.1 Hazard Identification for more detailed information about these hazards and their impacts on San Luis Obispo County as a whole).

Adverse Weather: Thunderstorm/Heavy Rain/Hail/Lighting/Dense Fog/Freeze

Templeton's risk and vulnerability to this hazard does not differ substantially from that of the County overall. Weather data for the North County Inland Area, Paso Robles Weather Station, can be found in subsection 5.3.1 of the Base Plan.

Adverse Weather: High Wind/Tornado

Templeton's risk and vulnerability to this hazard does not differ substantially from that of the County overall.

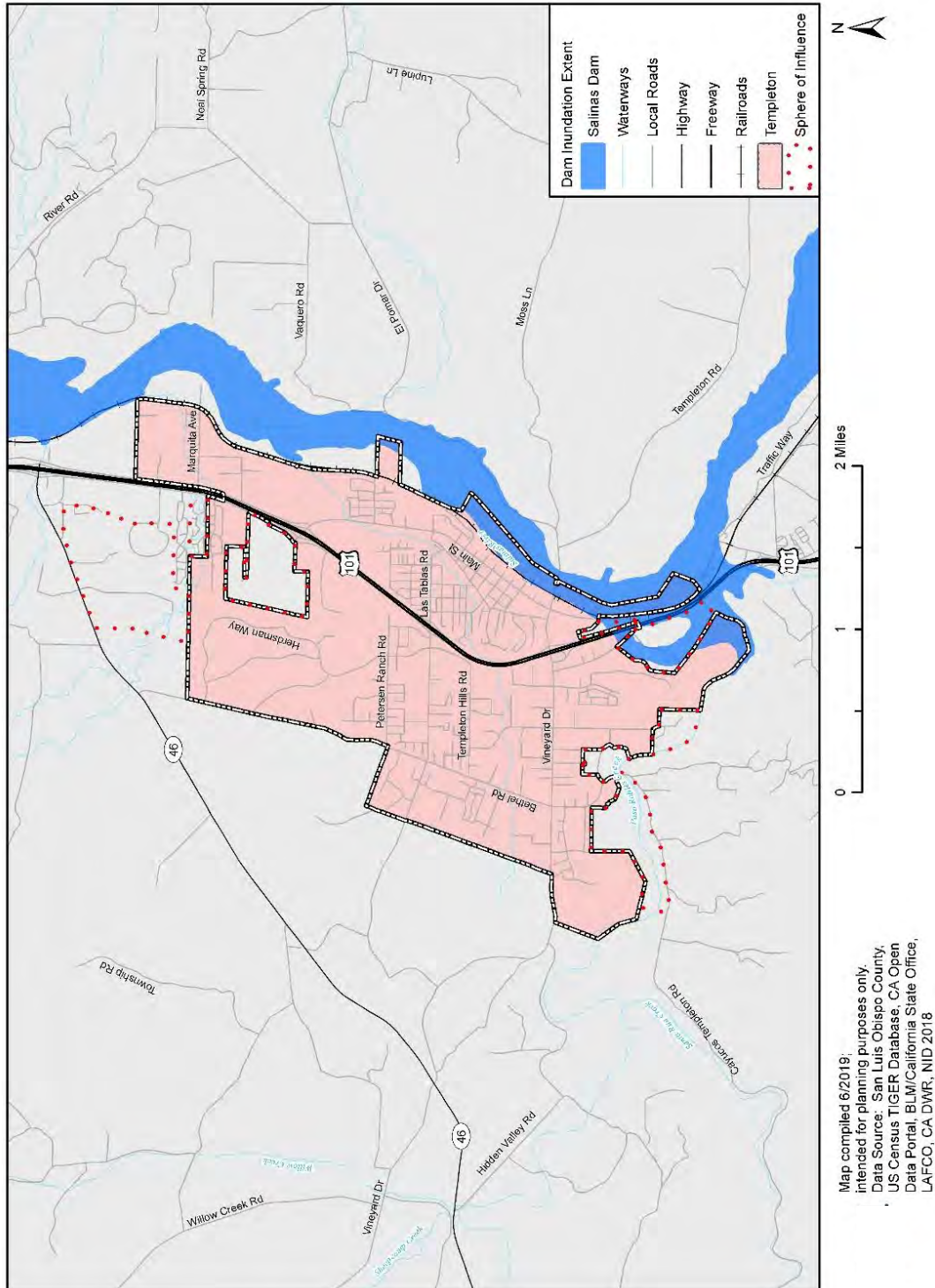
Adverse Weather: Extreme Heat

Templeton's risk and vulnerability to this hazard does not differ substantially from that of the County overall. Weather data for the North County Inland Area, Paso Robles Weather Station, can be found in subsection 5.3.1 of the Base Plan.

Dam Incidents

Figure P.3 shows dam inundation areas in the vicinity of Templeton CSD.

Figure P.3 Templeton Dam Inundation Areas



Drought and Water Shortage

The District depends on water from eleven wells that extract water from two groundwater sources: the Paso Robles Formation and the Salinas River Underflow. Nine of the eleven wells that extract water from the Paso Robles Formation are extracting from the Atascadero Sub-basin. While the primary basin, the Paso Robles Groundwater Basin, is experiencing decline in many areas, the Atascadero Sub-basin is a hydro-geologically distinct sub-basin that is separated from the primary basin by the Rinconada Fault line and has not experienced the level of decline when compared to the Paso Robles Ground Water Basin.

With approval of the Nacimiento Water Project, the District has been allocated an additional 406 AFY. The Nacimiento Water Project broke ground in 2007 and the construction of the infrastructures needed to deliver water to the Templeton area is complete. Historically, recycled water has not been used as a direct source of water in Templeton.

Earthquake

The only mapped fault in the Templeton area is the western trace of the potentially active Rinconada fault system referred to as the Jolon fault. The fault trends northwest through the community just south of the junction of Highways 46 and 101. Although there is evidence that indicates movement along the Rinconada fault, the fault lacks any geomorphic features to suggest the fault is active. Because the Rinconada fault is potentially active, it poses a moderate fault rupture hazard to this area. Further studies to evaluate the activity of the faults are warranted, prior to placing structures near the mapped fault traces. Templeton has 260 properties, including 3 critical facilities, at risk from soil liquefaction as shown below and displayed in Figure P.4.

Table P.9 Templeton CSD Property at High Risk of Liquefaction

Property Type	Property Count	Improved Value	Content Value	Total Value
Government/Utilities	8	--	--	\$0
Other/Exempt/Misc.	2	--	--	\$0
Residential	6	\$940,734	\$470,367	\$1,411,101
TOTAL	16	\$940,734	\$470,367	\$1,411,101

Source: San Luis Obispo County Planning and Building Dept., Assessor's Office, ParcelQuest, Wood Plc Parcel Analysis

Table P.10 Templeton CSD Property at Moderate Risk of Liquefaction

Property Type	Property Count	Improved Value	Content Value	Total Value
Commercial	19	\$16,362,297	\$16,362,297	\$32,724,594
Government/Utilities	7	--	--	\$0
Other/Exempt/Misc.	16	\$5,709,778	--	\$5,709,778
Residential	161	\$29,224,891	\$14,612,446	\$43,837,337
Mobile/Manufactured Homes	1	\$98,634	\$49,317	\$147,951
Residential: Other	1	\$6,694,405	\$3,347,203	\$10,041,608
Industrial	30	\$20,791,214	\$31,186,821	\$51,978,035
Vacant	9	\$3,053,339	--	\$3,053,339
TOTAL	244	\$81,934,558	\$65,558,083	\$147,492,641

Source: San Luis Obispo County Planning and Building Dept., Assessor's Office, ParcelQuest, Wood Plc Parcel Analysis

Figure P.4 Liquefaction Risk in the Templeton Area

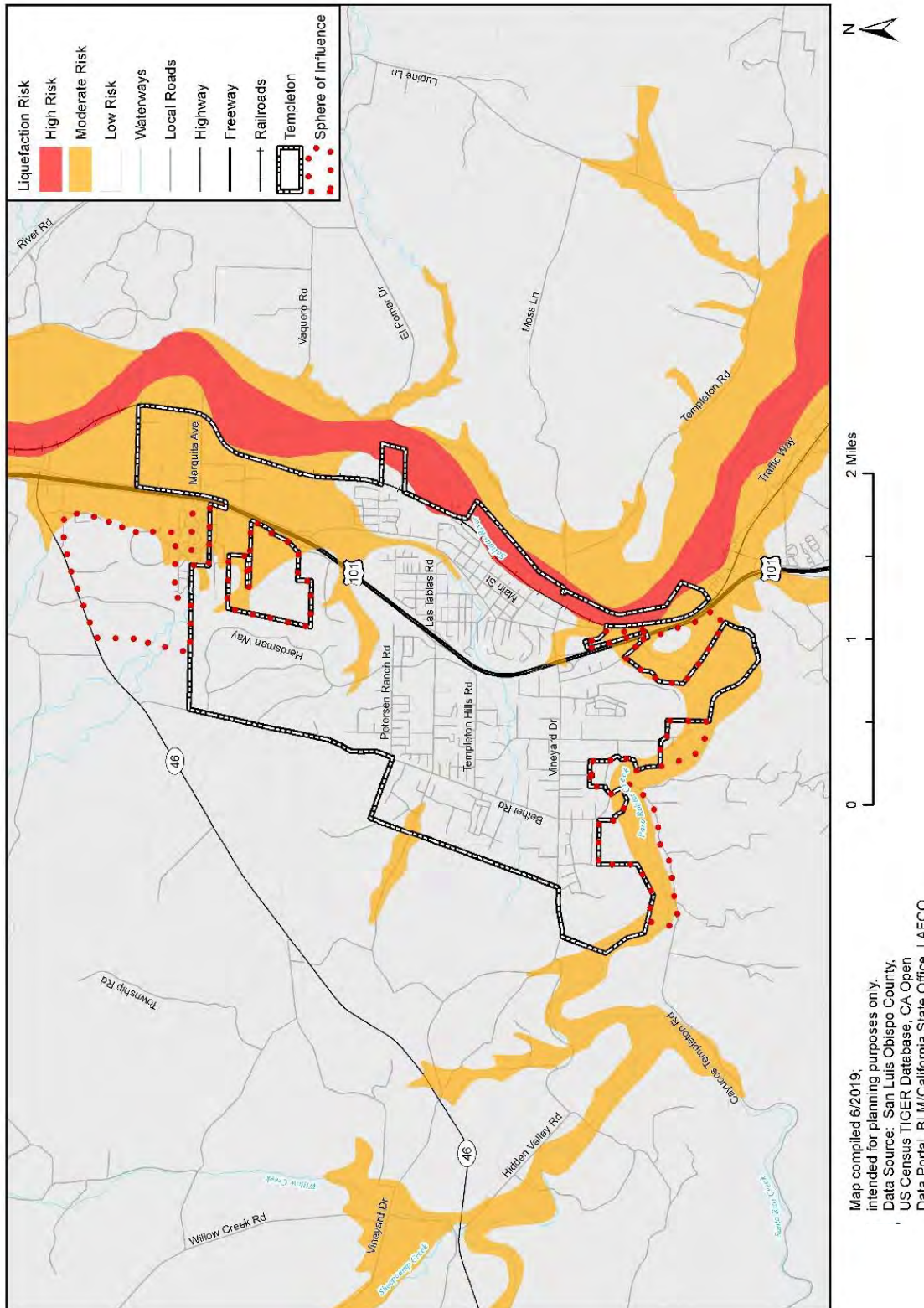


Table P.11 Templeton Critical Facilities at Risk of Liquefaction

Facility Type	Count	Risk
Local Law Enforcement	1	Moderate
Microwave Service Towers	2	Moderate
TOTAL	3	

Source: San Luis Obispo County Planning & Building, HIFLD 2017

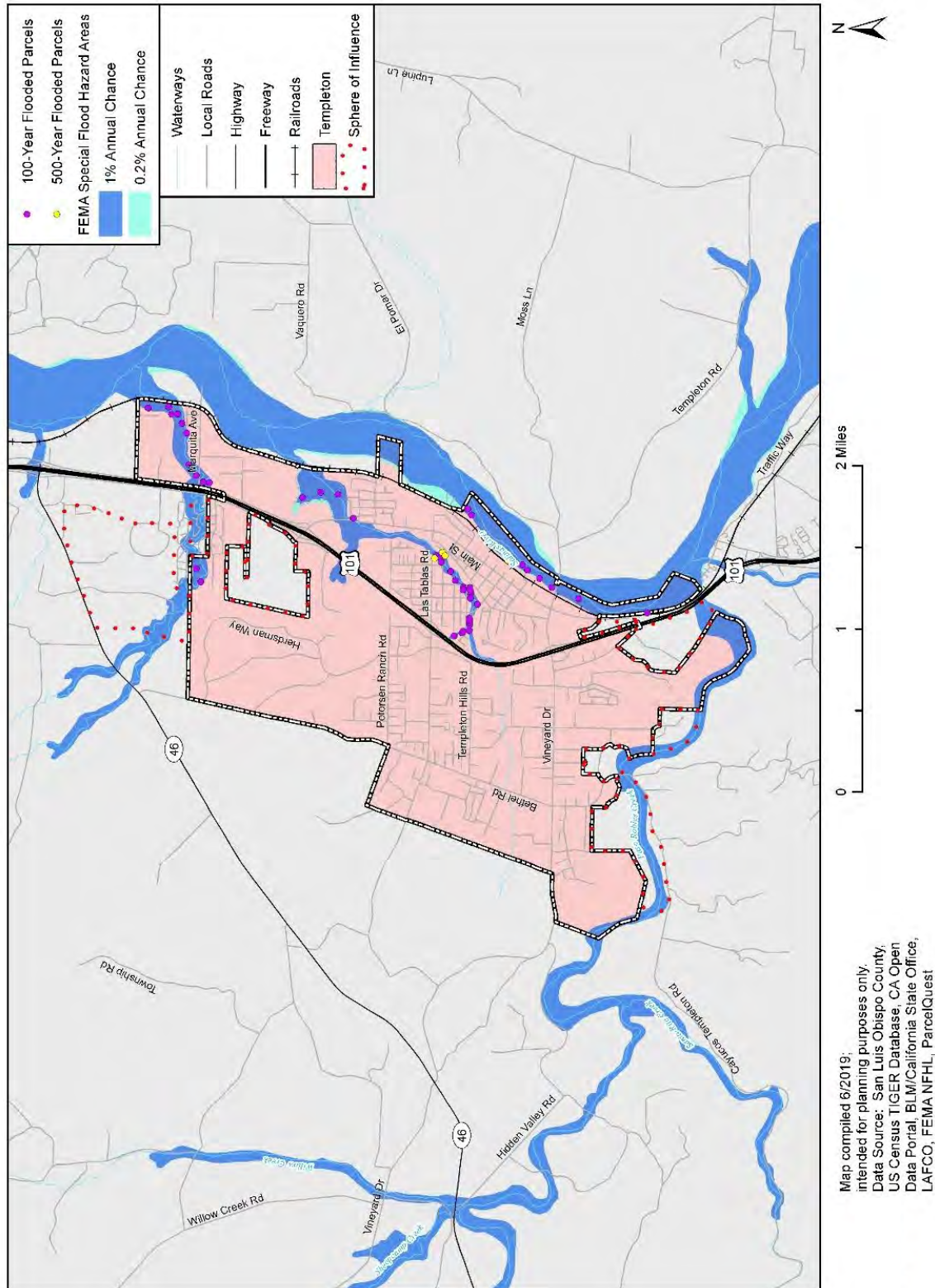
Flood

Values at Risk

Following the methodology described in subsection 5.3.11, a flood map for Templeton was created (see Figure P.5). Table P.12 and Table P.13 summarize the values at risk in the District's 100-year and 500-year floodplain, respectively. These tables also detail loss estimates for each flood scenario.

Templeton does not participate separately in the National Flood Insurance Program (NFIP) but will continue to support the County's participation in and compliance with the NFIP.

Figure P.5 Parcels at Risk of Flooding in Templeton



Population at Risk

Table P.12 Templeton CSD 1% (100 year) Floodplain Risk

Property Type	Parcel Count	Improved Value	Content Value	Total Value	Loss Estimate	Population
Commercial	1	\$644,112	\$644,112	\$1,288,224	\$322,056	---
Government/Utilities	4	--	--	\$0	\$0	---
Other/Exempt/Misc.	4	\$389,612	--	\$389,612	\$97,403	---
Residential	28	\$5,445,743	\$2,722,872	\$8,168,615	\$2,042,154	70
Mobile/Manufactured Homes	3	\$461,050	\$230,525	\$691,575	\$172,894	8
Industrial	6	\$3,310,724	\$4,966,086	\$8,276,810	\$2,069,203	---
Vacant	3	\$1,572,858	--	\$1,572,858	\$393,215	---
TOTAL	49	\$11,824,099	\$8,563,595	\$20,387,694	\$5,096,923	78

Source: San Luis Obispo County Planning and Building Dept., Assessor's Office, ParcelQuest, Wood Plc Parcel Analysis

Table P.13 Templeton CSD 0.2% (500 year) Floodplain Risk

Property Type	Parcel Count	Improved Value	Content Value	Total Value	Loss Estimate	Population
Government/Utilities	1	--	--	\$0	\$0	---
Residential	3	\$520,552	\$260,276	\$780,828	\$195,207	8
TOTAL	4	\$520,552	\$260,276	\$780,828	\$195,207	8

Source: San Luis Obispo County Planning and Building Dept., Assessor's Office, ParcelQuest, Wood Plc Parcel Analysis

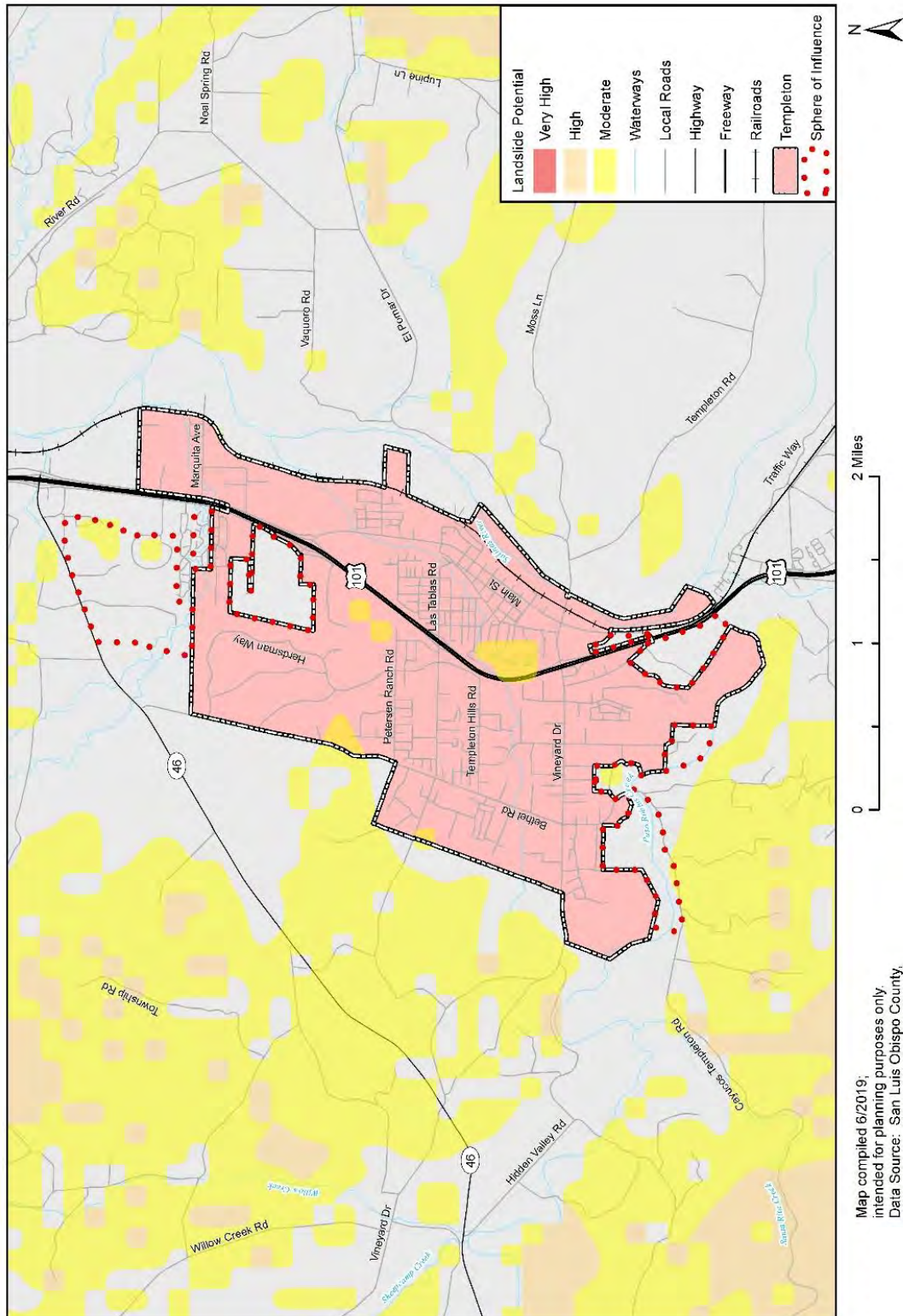
Critical Facilities at Risk

None of the District's identified critical facilities are located in the 1% Annual (100 year) or 0.2% Annual (500-year) Floodplain.

Landslide and Debris Flows

Figure P.6 shows areas with a known landslide risk in the Templeton area.

Figure P.6 Landslide Risk in the Templeton Area



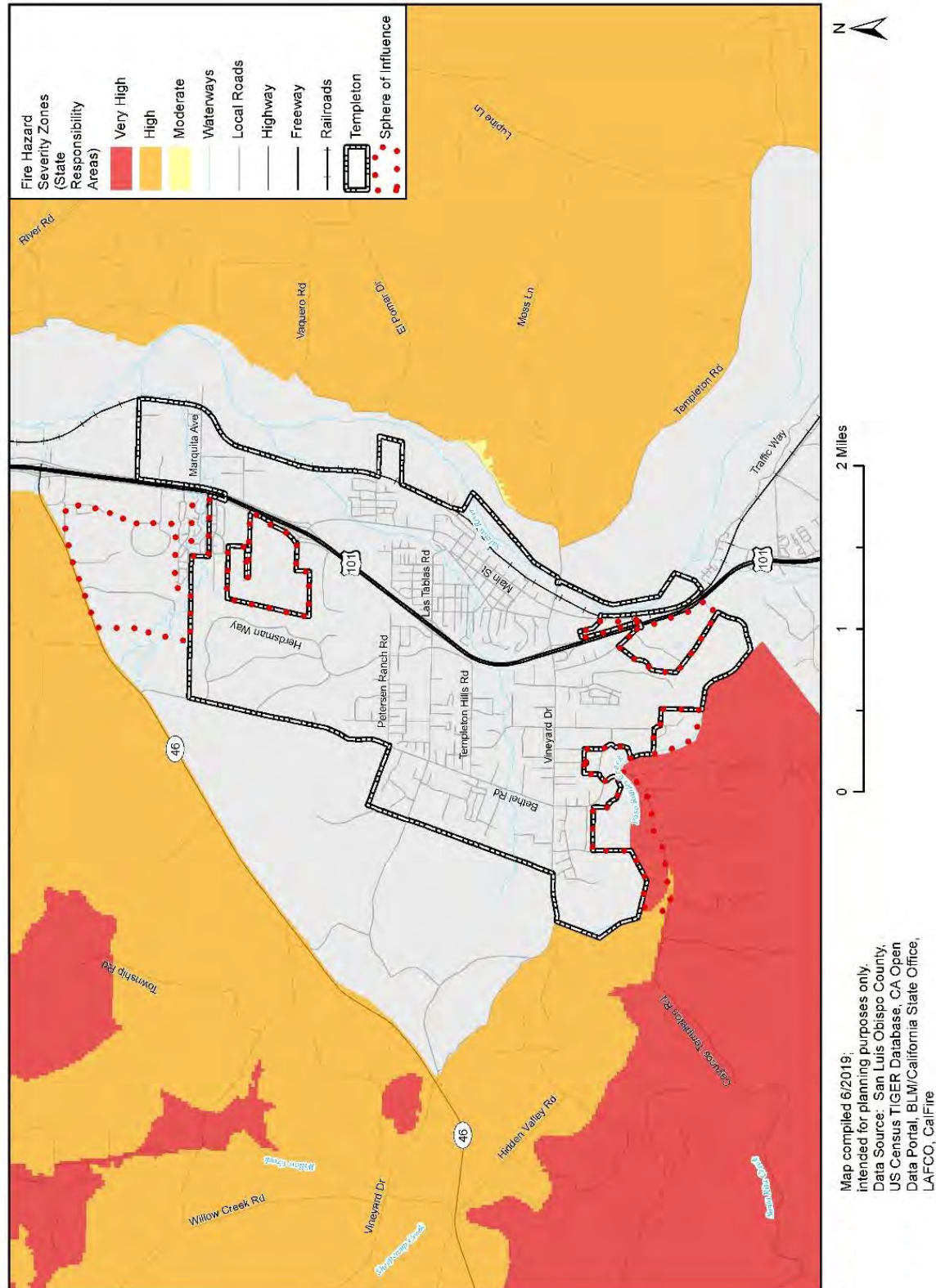
Subsidence

The March–August 1997 subsidence incident in the Paso Robles-Templeton-Atascadero region is described in subsection 5.3.13 of the Base Plan.

Wildfire

Wildfire is a high significance hazard for the Templeton Community Services District. While the District itself does not have any properties or critical facilities in moderate, high, or very high severity zones, the District is largely surrounded by high and very high severity zones, as shown in the Figure P.7.

Figure P.7 Fire Hazard Severity Zones in the Templeton Area



Human Caused: Hazardous Materials

The Cal OES Warning Center reports 26 hazardous materials incidents in the Templeton CSD from 1994 through October 24, 2018; as noted in subsection 5.3.16 of the Base Plan, this likely excludes a large number of unreported minor spills. (Cal OES reports an additional 209 incidents in unincorporated San Luis Obispo County, however a lack of data makes it difficult to know if any of those took place within the CSD boundaries.) This constitutes 5% of the hazardous materials incidents reported county-wide during the same time frame and averages out to roughly 3.9 incidents per year. As noted in subsection 5.3.16 only around 6% of reported hazardous materials incidents result in injuries, fatalities, or evacuations.

P.4 Capability Assessment

Capabilities are the programs and policies currently in use to reduce hazard impacts or that could be used to implement hazard mitigation activities. This capabilities assessment is divided into five sections: regulatory mitigation capabilities, administrative and technical mitigation capabilities, fiscal mitigation capabilities, mitigation outreach and partnerships, and other mitigation efforts.

To develop this capability assessment, the jurisdictional planning representatives used a matrix of common mitigation activities to inventory which of these policies or programs were in place. The team then supplemented this inventory by reviewing additional existing policies, regulations, plans, and programs to determine if they contributed to reducing hazard-related losses.

During the plan update process, this inventory was reviewed by the jurisdictional planning representatives and Wood consultant team staff to update information where applicable and note ways in which these capabilities have improved or expanded. Additionally, in summarizing current capabilities and identifying gaps, the jurisdictional planning representatives also considered their ability to expand or improve upon existing policies and programs as potential new mitigation strategies. The Templeton CSD capabilities are summarized below.

P.4.1 Regulatory Mitigation Capabilities

Table P.14 identifies existing regulatory capabilities the District has in place to help with future mitigation efforts. Note, many of the regulatory capabilities that can be used for the District are within the County's jurisdiction. Refer to Section 6 Capability Assessment for specific information related to the County's mitigation capabilities.

Table P.14 Templeton CSD Regulatory Mitigation Capabilities

Regulatory Tool	Yes/No	Comments
General Plan	Yes	SLO County Planning & Building
Zoning ordinance	Yes	SLO County Planning & Building
Subdivision ordinance	Yes	SLO County Planning & Building
Growth management ordinance	N/A	
Floodplain ordinance	Yes	SLO County
Other special purpose ordinance (stormwater, steep slope, wildfire)	Yes	SLO County
Building code	Yes	SLO County Planning & Building
Fire Department ISO rating	Yes	ISO Rating 3/3X
Building Department ISO Rating	Yes	SLO County Planning & Building
Erosion or sediment control program	Yes	SLO County Planning & Building
Stormwater management program	Yes	SLO County Public Works
Site plan review requirements	Yes	SLO County Planning & Building
Capital improvements plan	Yes	Every Budget Year
Economic development plan		
Local emergency operations plan	Yes	SLO County
Other special plans	Yes	Water Conservation Policy
Flood insurance study or other engineering study for streams	Yes	SLO County Flood Control District
Elevation certificates (for floodplain development)	Yes	SLO County Planning & Building

Source: Wood Data Collection Guide, 2019

P.4.2 Administrative/Technical Mitigation Capabilities

Table P.15 identifies the personnel responsible for activities related to mitigation and loss prevention in the Templeton Community Services District.

Table P.15 Templeton CSD Administrative/Technical Mitigation Capabilities

Personnel Resources	Yes/ No	Department/ Position	Comments
Planner/engineer with knowledge of land development/land management practices	Yes	Utilities Department District Engineer	Develops and maintains the District Rules, Regulations and Ordinances applicable to water and wastewater. Plan, to provide more detailed guidance for the development of more specific areas. Reviews private development projects and proposed capital improvements projects and other physical projects involving property for consistency and conformity with the local rules, regulations, codes and ordinances. Anticipates and acts on the need for new plans, policies, and code changes. Applies the approved plans, policies, code provisions, and other regulations to proposed land uses.
Engineer/professional trained in construction practices related to buildings and/or infrastructure	Yes	Utilities Department District Engineer	Oversees the effective, efficient, fair, and safe enforcement of the California Building Code.
Planner/engineer/scientist with an understanding of natural hazards	Yes	Utilities Department District Engineer	Reviews Grading and Building Plans to ensure that development is in compliance with existing policies and codes relating to mitigation of natural hazards.
Personnel skilled in GIS		SLO County Building Official	SLO County Planning & Building
Full time building official	Yes	SLO County (Engineering Division)	Reviews and ensures that new development proposals do not increase flood risk, and that new developments are not located below the 100-year flood level. In addition, the Floodplain Administrator is responsible for planning and managing flood risk reduction projects throughout the District.
Floodplain manager	Yes	SLO County (Engineering Division)	Reviews and ensures that new development proposals do not increase flood risk, and that new developments are not located below the 100-year flood level. In addition, the Floodplain Administrator is responsible for planning and managing flood risk reduction projects throughout the District.
Emergency manager	Yes	Emergency Services (Fire Chief)	Coordinates local response and relief activities and works closely with county, state, and federal partners to support planning and training and to provide information and coordinate assistance.
Grant writer	No		
Other personnel			
GIS Data Resources	Yes	County	

Personnel Resources	Yes/ No	Department/ Position	Comments
(Hazard areas, critical facilities, land use, building footprints, etc.)			
Warning systems/services (Reverse 9-11, outdoor warning signals)	Yes	Reverse 911 and EAS activated through Sherriff's Department	
Procurement Services Manager	No		

Source: Wood Data Collection Guide, 2019

P.4.3 Fiscal Mitigation Capabilities

Table P.16 identifies financial tools or resources that the CSD could potentially use to help fund mitigation activities.

Table P.16 Templeton CSD Fiscal Mitigation Capabilities

Financial Resources	Accessible/Eligible to Use (Yes/No)
Community Development Block Grants	Yes
Capital improvements project funding	Yes
Authority to levy taxes for specific purposes	Yes
Fees for water, sewer, gas, or electric services	Yes
Impact fees for new development	Yes
Incur debt through general obligation bonds	Yes
Incur debt through special tax bonds	Yes
Incur debt through private activities	Yes
Withhold spending in hazard prone areas	Yes

P.4.4 Mitigation Outreach and Partnerships

The Templeton Community Services District conducts several ongoing public education or information programs, to include fire safety, disaster preparedness, wildland preparedness, responsible water use, and FOG (fats, oils and greases).

P.4.5 Opportunities for Enhancement

Based on the capability assessment, the Templeton Community Services District has several existing mechanisms in place that already help to mitigate hazards. There are also opportunities for the District to expand or improve on these policies and programs to further protect the community. Future improvements may include providing training for staff members related to hazards or hazard mitigation grant funding in partnership with the County and Cal OES. Additional training opportunities will help to inform District staff and board members on how best to integrate hazard information and mitigation projects into the District policies and ongoing duties of the District. Continuing to train District staff on mitigation and the hazards that pose a risk to the District will lead to more informed staff members who can better communicate this information to the public.

P.5 Mitigation Strategy

The District developed the mitigation strategy as part of the 2019 County HMP update, as described in Section 7 Mitigation Strategy.

P.5.1 Mitigation Goals and Objectives

The District mitigation strategy is aligned with the overall County hazard mitigation goals detailed in subsection 7.1 in the Base Plan.

P.5.2 Mitigation Actions

The planning team for the Templeton Community Services District identified and prioritized the following mitigation actions based on the risk assessment. Actions were prioritized using the process described in subsection 7.2.1 of the Base Plan. Background information and information on how each action will be implemented and administered, such as ideas for implementation, responsible office, potential funding, estimated cost, and timeline are also included. Actions with an '*' are those that mitigate losses to future development.

Table P. 17 Templeton Community Services District's Mitigation Action Plan

ID	Hazard(s) Mitigated	Description/Background/Benefits	Lead Agency and Partners	Cost Estimate	Potential Funding	Priority	Timeline	Status/ Implementation Notes
T.1	Adverse Weather (thunderstorm, lightning, high wind, extreme heat), Drought and Water Shortage, Earthquake, Flood, Wildfire	Determine backup power needs and requirements for various locations within the District determined to be critical to maintain essential District services. Install quick-connects at identified facilities. Research and purchase appropriately sized generators or portable generator(s).	Fire	Unknown	General fund, grants	High	1 year	New. Much of TCSD's critical infrastructure lacks backup power, including water wells and sewer lift stations. This could severely compromise the District's ability to deliver essential services during a power outage caused by hazards such as adverse weather, earthquake, flood, or wildfire. This becomes even more critical in the case of a drought or water shortage. The potential failure of one or more wells due to declining groundwater levels makes it all the more essential that the other wells have reliable backup power.
T.2	Drought/ Water Shortage	Initiate a Drought public awareness and educational campaign to discuss the impacts of drought and water shortage, and steps each individual can take during periods of drought and ways to reduce water consumption during periods of drought.	District Administration	Low cost	General fund, staff time	Medium	Annual implementation	New
T.3	Wildfire	Continue to support the District's weed abatement program to provide additional wildfire mitigation through vegetation management.	Fire	\$10,000	General fund, staff time	Medium	Annual implementation	New

P.6 Implementation and Maintenance

Moving forward, the Templeton Community Services District will use the mitigation action table in the previous section to track progress on implementation of each project. Implementation of the plan overall is discussed in Section 8 of the main plan.

P.6.1 Incorporation into Existing Planning Mechanisms

The information contained within this plan, including results from the Vulnerability Assessment, and the Mitigation Strategy will be used by the Community Services District to help inform updates of the Templeton Community Plan and in the development of additional local plans, programs and policies. Understanding the hazard that pose a risk and the specific vulnerabilities to the jurisdiction will help in future capital improvement planning for the District. The County Planning and Building Department may utilize the hazard information when reviewing a site plan or other type of development applications with the boundaries of the Templeton Community Services District area. As noted in Section 8, the HMPC representatives from the Templeton Community Services District will report on efforts to integrate the hazard mitigation plan into local plans, programs and policies and will report on these efforts at the annual HMPC plan review meeting.

P.6.2 Monitoring, Evaluation and Updating the Plan

The Templeton Community Services District will follow the procedures to monitor, review, and update this plan in accordance with San Luis Obispo County as outlined in Section 8 of the Base Plan. The District will continue to involve the public in mitigation, as described in subsection 8.3 of the Base Plan. The CSD General Manager will be responsible for representing the Community Services District in the County HMPC, and for coordination with County staff and departments during plan updates. The Templeton Community Services District realizes it is important to review the plan regularly and update it every five years in accordance with the Disaster Mitigation Act Requirements as well as other State of California requirements.

Q.1 District Profile

Q.1.1 Mitigation Planning History and 2019 Process

This Annex for the Cayucos Sanitary District (District) was created during the development of the 2019 Multi-Jurisdictional San Luis Obispo County Hazard Mitigation Plan update. The District had representation on the County multi-jurisdictional Hazard Mitigation Planning Committee and utilized a Local Planning Team (LPT) subcommittee to develop input into the annex.

Table Q.1 Cayucos Hazard Mitigation Plan Revision Planning Group

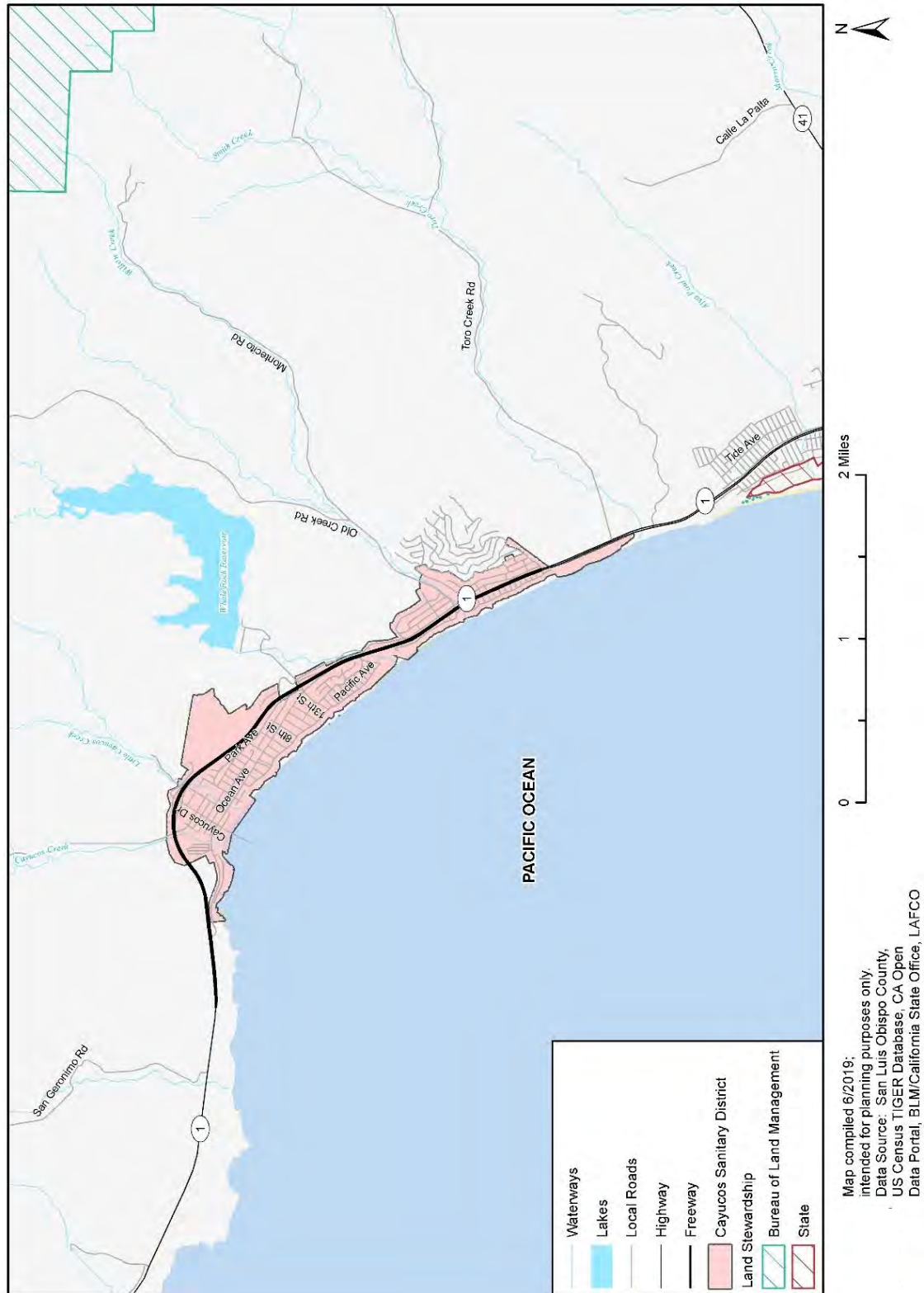
Department or Stakeholder	Title
Cayucos Sanitary District Staff	District Manager
Cayucos Sanitary District Staff	Administrative Office Manager

More details on the planning process and the jurisdictions, service districts, and stakeholder's participation can be found in Section 3 of the Base Plan, along with how the public was involved during the 2019 update.

The Cayucos Sanitary District is located in the central coastal portion of San Luis Obispo County. Figure Q.1 shows the Cayucos Sanitary District's planning area.



Figure Q.1 Cayucos Sanitary District



Q 1.2 District Overview

Cayucos is a Census-Designated Place (CDP) located on the coast of San Luis Obispo County, along State Route (SR) 1 between Cambria to the north and Morro Bay to the south. The Cayucos Sanitary District was formed in 1942 for the purpose of constructing a sewer collection system and a treatment plant (Cayucos Sanitary District 2019). The powers and functions of the District include but are not limited to maintenance and operation of garbage dumpsites, garbage collection and disposal systems, and storm water drains. The District encompasses 0.984 square miles within the County of San Luis Obispo's central coast (Figure Q.1) (Kuczynski and Sharygin 2018). In 1954, the District constructed a sewer system and treatment plant under a Joint Powers Agreement (JPA) with the Morro Sanitary District, which is now the City of Morro Bay, to create comprehensive solutions to stormwater management issues in the area (City of Morro Bay n.d.). The Plant currently serves an approximate population of 13,300 people including approximately 2,500 customers within the Cayucos Sanitary District (Wilson 2015; Mecham and Gibson 2009). However, the current shared Wastewater Treatment Plant's infrastructure has become out-of-date. The Cayucos Sanitary District has voted to withdraw from the joint Construction of a New Wastewater Treatment Facility and construct and operate a separate Wastewater Treatment Plant. Cayucos Sanitary District has begun construction and will begin utilization of the separate facility once construction has been completed in December 2020.

Q 1.3 Population

The Cayucos CDP had a population of 2,847 in 2017, which accounts for approximately 1.0% of the County's population. The CDP experienced a growth of 17.1% from 2,431 residents in 2012. The U.S. Census Bureau's 2017 American Community Survey provides select demographic and social characteristics for the CDP (Table Q.2); however, it should be noted that data is for the Cayucos CDP which may have different boundaries than the Cayucos Sanitary District's service area.

Table Q.2 Cayucos Demographics and Social Characteristics, 2017

Characteristic	2012	2017	% Change
Population	2,431	2,847	17.1%
Median Age	57.2	56.0	-2.1%
Total Housing Units	2,427	2,459	1.3%
Housing Occupancy Rate	50.0%	56.7%	6.7%
% of Housing Units with no Vehicles Available	4.5%	2.8%	-1.7%
Median Home Value	\$688,700	\$720,900	4.7%
Unemployment	10.4%	4.0%	-6.4%
Mean Travel Time to Work (minutes)	18.2	27.0	48.4%
Median Household Income	\$62,961	\$61,226	-2.8%
Per Capita Income	\$42,023	\$43,132	2.6%
% of Individuals Below Poverty Level	15.8%	13.4%	-2.4%
# of Households	1,214	1,395	14.9%
Average Household Size	1.99	2.04	2.5%
% of Population Over 25 with High School Diploma	94.5%	95.6%	1.1%
% of Population Over 25 with Bachelors Degree or Higher	40.5%	38.0%	-2.5%
% with Disability	15.7%	16.9%	1.2%
% Speak English less than "Very Well"	1.2%	2.5%	1.3%

Source: U.S. Census Bureau American Community Survey 2012-2017 5-Year Estimates, www.census.gov/

Q.1.4 Development Trends

The community of Cayucos developed general community goals that were recommended by the Cayucos Citizens Advisory Council (CCAC) for the Estero Area Plan (2009). The identified community goals encourage carefully planned development that respects the area's natural assets, maintains the community's small-town beach character, and balances and promotes both the residential and visitor-serving aspects of the community. The Estero Area Plan also indicated the goal to carefully plan for future commercial and residential development that is consistent with the current nature of the community, with a focus on infill and mixed-use development.

Cayucos has a high percentage of vacant dwelling units compared to the county as a whole. This is largely due to a high level of seasonal use (about 33% of total units), which includes recreational and occasional use of dwellings. The vacancy rate in Cayucos is approximately 38% (Estero Area Plan, 2009). According to the LPT, future development trends are likely to lead to additional building of single-family residents as well as mixed use and infill development in the community.

Q.1.5 Other Community Planning Efforts

Coordination and synchronization with other community planning mechanisms and efforts are vital to the success of this plan. To have a thorough evaluation of hazard mitigation practices already in place, appropriate planning procedures should involve identifying and reviewing existing plans, policies, regulations, codes, tools, and other actions. These mitigation practices should incorporate reduction strategies to minimize a community's risk and vulnerability from natural hazards. The Cayucos Citizens Advisory Council works to develop a unified, cooperative effort among all individuals, organizations and public jurisdictions interested in furthering sound planning and development in the Cayucos area (Cayucos Citizen's Advisory Council n.d.). The Council was responsible for the recommendations to the Cayucos community goals to encourage the carefully planned development of the District with respect to the small-town character and area's natural assets (Mecham and Gibson 2009).

As an unincorporated community, Cayucos Sanitary District is referenced in other County planning documents and is regulated by County policies and planning mechanisms. Integrating existing planning efforts, mitigation policies, and action strategies into this Annex establishes a credible, comprehensive document that weaves the linkages of a community's values together. The development of this jurisdictional Annex involved a comprehensive review of existing plans, studies, reports, and initiatives from San Luis Obispo County and the Cayucos Sanitary District that relate to hazards or hazard mitigation, as summarized in the Table Q.3. Information on how they informed the update are noted and incorporated where applicable.

Table Q.3 Summary of Review of Key Plans, Studies and Reports

Plan, Study, Report Name	How the Document Informed this Annex
Estero Area Plan (2009)	Informed the geographic description and natural resources information
San Luis Obispo Safety Plan Element (2019)	Addresses a range of natural and human caused hazards and consists of goals and policies aimed at reducing the risks associated with these hazards.
San Luis Obispo County Stormwater Resource Plan (2019)	Provided background information that was incorporated into the Drought Vulnerability Assessment related to watershed planning.
County of San Luis Obispo Local Hazard Mitigation Plan (2014)	Informed past hazard event history.
San Luis Obispo County – Tsunami Emergency Response Plan (Revised April 2016)	Informed the Vulnerability Assessment for Tsunami risk

San Luis Obispo County – Community Wildfire Protection Plan (March 2019)

Informed the Vulnerability Assessment for Wildfire risk

Q.2 Hazard Identification and Summary

The Cayucos Sanitary District's LPT identified the hazards that affect the District and summarized their frequency of occurrence, spatial extent, potential magnitude, and significance specific to Cayucos (see Table Q.4). There are no hazards that are unique to the District.

Table Q.4 Cayucos Sanitary District – Hazard Summaries

Hazard	Geographic Area	Probability of Future Occurrence	Magnitude/Severity (Extent)	Overall Significance
Adverse Weather	Extensive	Likely	Critical	High
Coastal Storm/Coastal Erosion/Sea Level Rise	Significant	Likely	Limited	Medium
Earthquake and Liquefaction	Extensive	Occasional	Limited	High
Flooding	Significant	Likely	Critical	High
Landslide and Debris Flows	Limited	Occasional	Limited	Medium
Tsunami and Seiche	Significant	Occasional	Critical	Medium
Wildfire	Significant	Occasional	Limited	Medium
Human Caused: Hazardous Materials	Limited	Unlikely	Negligible	Low
Geographic Area Limited: Less than 10% of planning area Significant: 10-50% of planning area Extensive: 50-100% of planning area Probability of Future Occurrences Highly Likely: Near 100% chance of occurrence in next year or happens every year. Likely: Between 10 and 100% chance of occurrence in next year or has a recurrence interval of 10 years or less. Occasional: Between 1 and 10% chance of occurrence in the next year or has a recurrence interval of 11 to 100 years. Unlikely: Less than 1% chance of occurrence in next 100 years or has a recurrence interval of greater than every 100 years.		Magnitude/Severity (Extent) Catastrophic—More than 50 percent of property severely damaged; shutdown of facilities for more than 30 days; and/or multiple deaths Critical—25-50 percent of property severely damaged; shutdown of facilities for at least two weeks; and/or injuries and/or illnesses result in permanent disability Limited—10-25 percent of property severely damaged; shutdown of facilities for more than a week; and/or injuries/illnesses treatable do not result in permanent disability Negligible—Less than 10 percent of property severely damaged, shutdown of facilities and services for less than 24 hours; and/or injuries/illnesses treatable with first aid Significance Low: minimal potential impact Medium: moderate potential impact High: widespread potential impact		

Q.3 Vulnerability Assessment

The intent of this section is to assess the Cayucos Sanitary District's vulnerability separately from that of the planning area as a whole, which was previously assessed in Section 5 (Vulnerability Assessment) in the Base Plan.

This vulnerability assessment analyzes the population, property, and other assets at risk to hazards ranked of medium or high significance that may vary from other parts of the planning area.

The information to support the hazard identification and risk assessment for this Annex was collected through a data request worksheet/workbook, which was distributed to each participating municipality or special district to complete during the original outreach process in 2019. Collected information was analyzed and summarized in order to identify and rank hazards with potential impacts in the County, as well as in each jurisdiction. In addition, the Cayucos Sanitary District's HMPC team was asked to validate the data that was originally scored in 2019 based on the experience and perspective of the planning team relative to the Cayucos Sanitary District.

Each participating jurisdiction was in support of the main hazard summary identified in the base plan. However, the hazard summary rankings for each jurisdictional annex may vary slightly due to specific hazard risk and vulnerabilities unique to that jurisdiction. Identifying these differences helps the reader to differentiate the jurisdiction's risk and vulnerabilities from that of the overall County.

Note: The hazard "Significance" reflects overall ranking for each hazard, and is based on the Cayucos Sanitary District HMPC member input from the Data Collection Guide and the risk assessment developed during the planning process (see Section 3 of the Base Plan), which included a more detailed qualitative analysis with best available data.

The hazard summaries in Table Q.4 reflect the hazards that could potentially affect the Sanitary District. Based on this analysis, the priority hazards (High Significance) for mitigation include flood/levee failure and hazardous materials incidents. Those of Medium or High Significance are identified below. The discussion of vulnerability for each of the following hazards is located in subsection Q.3.2 Estimating Potential Losses.

- Adverse Weather: Thunderstorm/Heavy Rain/Hail/Lightning/Dense Fog/Freeze
- Adverse Weather: High Wind/Tornado
- Adverse Weather: Extreme Heat
- Coastal Storm/Coastal Erosion/Sea Level Rise
- Earthquake
- Flood
- Landslides and Debris Flow
- Tsunami and Seiche
- Wildfire
- Hazardous Materials

Other Hazards

Hazards assigned a Significance rating of Low and which do not differ significantly from the County ranking (e.g., Low vs. High) are not addressed further in this plan, and are not assessed individually for specific vulnerabilities in this section. In the Cayucos Sanitary District, those hazards are as follows:

- Agricultural Pest Infestation and Disease
- Biological Agents
- Dam Incidents
- Drought
- Subsidence

Additionally, the District's Committee members decided to rate several hazards as Not Applicable (N/A) to the planning area due to a lack of exposure, vulnerability, and no probability of occurrence. Agricultural Pest

Infestation and Disease, Biological Agents (naturally occurring), Dam Incidents, and Drought and Water Storage are considered Not Applicable (N/A) to the Cayucos Sanitary District.

Q.3.1 Assets at Risk

This section considers the District's assets at risk, including values at risk, critical facilities and infrastructure, historic assets, economic assets, and growth and development trends.

Values at Risk

The following data on property exposure is derived from the San Luis Obispo County 2019 Parcel and Assessor data. This data should only be used as a guideline to overall values in the District as the information has some limitations. The most significant limitation is created by Proposition 13; instead of adjusting property values annually, the values are not adjusted or assessed at fair market value until a property transfer occurs. As a result, overall value information is likely low and does not reflect current market value of properties. It is also important to note that in the event of a disaster, it is generally the value of the infrastructure or improvements to the land that is of concern or at risk. Generally, the land itself is not a loss. Types shows the exposure of properties (e.g., the values at risk) broken down by property type for the District.

Table Q.5 Parcel Exposure for the Cayucos Sanitary District by Parcel Types

Property Type	Property Count	Improved Value	Content Value	Total Value
Commercial	39	\$9,782,615	\$9,782,615	\$19,565,230
Government/Utilities	48	\$169,629	--	\$169,629
Other/Exempt/Misc.	56	\$13,218,262	--	\$13,218,262
Residential	1,755	\$393,106,071	\$196,553,036	\$589,659,107
Multi-Family Residential	205	\$35,795,268	\$17,897,634	\$53,692,902
Mobile/Manufactured Homes	3	\$2,669,705	\$1,334,853	\$4,004,558
Residential: Other	29	\$13,634,803	\$6,817,402	\$20,452,205
Vacant	21	\$2,118,123	--	\$2,118,123
Total	2,156	\$470,494,476	\$232,385,539	\$702,880,015

Source: Wood Plc analysis based on ParcelQuest and San Luis Obispo County Assessor's Office data 2019

Critical Facilities and Infrastructure

Critical facilities are essential in providing utility or direction either during the response to an emergency or during the recovery operation. See subsection 5.2 Asset Summary of the base plan for more details on the definitions and categories of critical facilities.

An inventory of critical facilities in the District was obtained from San Luis Obispo County, the County's Local Agency Formation Commission, or LAFCO, and the Homeland Infrastructure Foundation-Level Data (HIFLD). The combined dataset as applicable to the District is provided in Table Q.9 and illustrated in Figure Q.4 below.

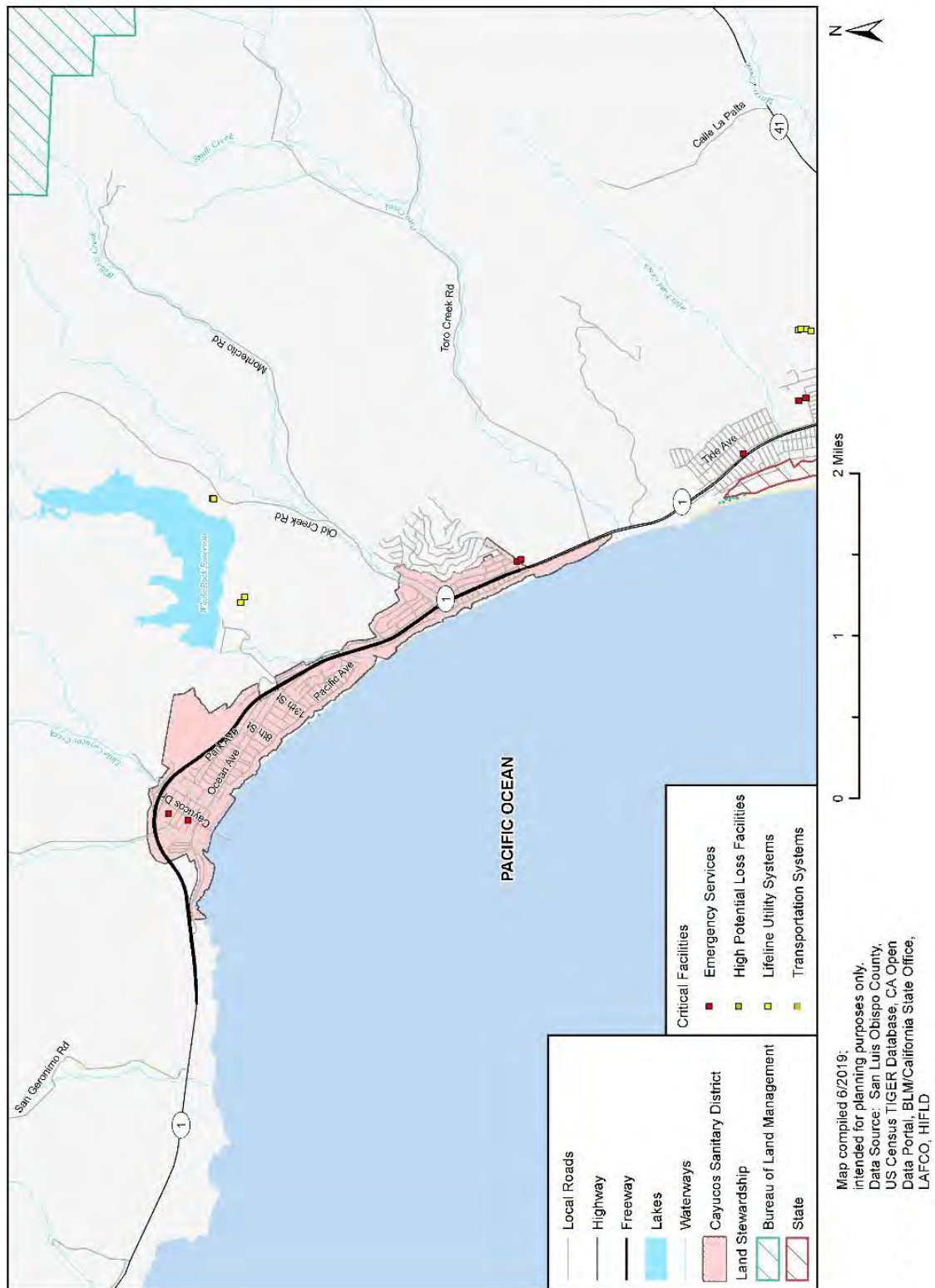
Table Q.6 Cayucos Sanitary District Critical Facilities

Category of Facility	Facility Type	Name	Counts
Emergency Services	Fire Stations	California Department of Forestry and Fire Protection Station 11 - Cayucos Fire Station	1
		Cayucos Fire Protection District	1
	Emergency Medical Service Stations	California Department of Forestry and Fire Protection Station 11 - Cayucos Fire Station	1
	Public Schools	Cayucos Elementary School	1
Total			4

Source: San Luis Obispo County Planning and Building, LAFCO, HIFLD



Figure Q.2 Cayucos Sanitary District Critical Facilities



Additional Critical Facilities

Additional critical facilities as identified by the Cayucos Sanitary District Local Planning Team are as follows. Note their estimated replacement value is indicated as well as the possible hazards to which they are at risk:

- Sewer Conveyance System - \$55 million (at risk of flooding and earthquakes)
- Sewer Lift Stations - \$5 million (at risk of flooding and earthquakes)
- Treatment Facility that will be operating in the year 2020 - \$30 million (at risk of flooding and earthquakes)

Emergency Service Facilities

The District contains four Emergency Services facilities aimed at providing for the health and welfare of the entire community. These include two fire stations, one emergency medical service station, and one school, as noted in Table Q.9.

Transportation Systems and High Potential Loss Facilities

No critical transportation facilities were noted for the District, though there may be certain structures or entities important to the District particularly along the main corridor running through the District (Highway 1) or other major nearby transportation lines (e.g. Highway 41). The District is served by a network of local roadways, and Highway 1 and Old Creek Road provide regional access to the District.

No high potential loss facilities such as power plants were identified by the county, HIFLD dataset, or the Planning Team. However as will be noted under the Human Caused Hazards section of this annex as well as in Section 5 of the Base Plan, several Hazardous Materials (HazMat) incidents have occurred in or in close proximity to the District, so there is a history of hazardous spills or incidents in/near the community.

Historic and Cultural Resources

The Cayucos Sanitary District has no registered state or federal historic sites; however, locally designated historic sites are detailed in the Estero Area Plan. These include the Cayucos Pier, which was built in 1874, and the Captain James Cass House Complex, which was built in 1876 by the founder of Cayucos, James Cass. The James Cass House Complex is located on Ocean Avenue in proximity to the Cayucos Pier. The historic property designation includes the adjacent barn, tank house, and cooler building.

Natural Resources

Natural resources are important to include in benefit-cost analyses for future projects and may be used to leverage additional funding for projects that also contribute to community goals for protecting sensitive natural resources. The natural topography of the Cayucos coastline varies from low bluffs and coastal terraces to sandy beaches backed by low-lying areas. The District includes a portion of the Estero Bluffs State Park, which preserves the scenic coastline and rich diversity of habitats. The Estero Bluffs are characterized by marine and intertidal habitat, coastal foredune, coastal and riparian scrub, and grasslands, which collectively provide habitat for numerous native and endangered species.

The Cayucos community also has approximately five acres of neighborhood and community park space utilized for passive and active recreation for residents (Mecham and Gibson 2009). Additionally, a portion of the Monterey Butterfly habitat site in Cayucos has been frequented by large numbers of butterflies for a number of years and is a significant habitat site in the state for monarch butterflies. The butterflies cluster in a small area on a mixture of eucalyptus and cypress trees growing along a creek bed close to a residential area. Awareness of natural assets can lead to opportunities for meeting multiple objectives. For instance, preserving riparian areas protects sensitive habitat and attenuates and stores floodwaters.

Economic Assets

Businesses in the District provide retail and service uses to local residents, which generally exclude major employers, large-scale manufacturing, and industrial jobs (Mecham and Gibson 2009). Tourism is an important industry for the local Cayucos economy; however, residents spend significant portions of their money in more developed commercial sectors outside of the District. Roughly 85 to 90 percent of the community's workers commute to jobs in other communities. Effectively planned commercial, visitor-serving, and residential development that is consistent with the current nature of the small-beach town community has the opportunity to improve the local economy. Additionally, in 2018 Cayucos Sanitary District began the construction of the new Wastewater Treatment Plant, the Cayucos Sustainable Water Project (Wilson 2015). This treatment plant will serve as a source of income for local job production and is planned to begin operation in December 2020.

Q.3.2 Estimating Potential Losses

This section details vulnerability to specific hazards and if applicable, jurisdictional differences from that of the overall County. Table Q.5 above shows Cayucos Sanitary District's exposure to hazards in terms of number and value of structures. San Luis Obispo County parcel and assessor data were used to calculate the improved value of parcels. Impacts of past events and vulnerability to specific hazards are further discussed below. (See Section 5 Hazard Identification and Risk Assessment of the base plan for more detailed information about these hazards and their impacts on San Luis Obispo County as a whole.)

Adverse Weather

Adverse Weather in Cayucos includes hail, wind storms, and thunderstorms. Heavy rainfall events effect the District annually, and the community's proximity to the Pacific Ocean exacerbates adverse weather compared to inland communities. Such events can induce other hazards such as flooding. Cayucos is subject to strong southeasterly winds associated with strong cold fronts and coastal storms, which generally occur during the winter months from November to February. Northwesterly winds that are typical of the central coast of California also occur throughout San Luis Obispo during the spring and summer. Both southeast and northwest wind events can reach sustained wind speeds of 35-45 mph with wind gusts of 65-75 mph within the City. Overall, adverse weather hazards have been rated by the planning team as holding **High Significance** for the District.

Coastal Storm/Coastal Erosion/Sea Level Rise

The shoreline in Cayucos consists mainly of narrow beaches backed by low cliffs approximately 20 feet-high, as well as a low-lying downtown area by Cayucos Creek, much of which is protected by low rock revetments and a low seawall. Over 100 residences with minimal setbacks from the edge of the bluff are potentially exposed to coastal erosion hazards, although a number are protected by rock revetments or seawalls. In the winter month the sandy beach often erodes, and waves strike directly against the bluffs. The Cayucos shoreline faces south such that its beaches are partially protected from northerly swells. Wave action in this area is still significant. The seacliffs are comprised of Franciscan melanges, characterized by blocks of rocks often surrounded by small zones of sheared or crushed rock that tend to erode easily. Some zones contain more erosion resistant rock blocks that have been exposed as the weaker blocks have eroded away. During the intense storm waves of 1983, these resistant blocks were breached at some spots. As a result, the bluff receded as much as 20 feet (San Luis Obispo County 1999). Rates of erosion are highly variable along this coastline, and range from 6 to 10 inches per year. Emergency rip-rap and numerous seawalls were constructed in response to the storm waves of 1983 (San Luis Obispo County 1999). Downtown Cayucos is another area of concern. Built upon the unconsolidated sediment deposited from the Cayucos creek, this area is susceptible to shoreline erosion.

During rainy months when the ground becomes wet, the low permeability of the clays tends to perch or elevate the groundwater table. Consequently, the saturated soils cause increased erosion due to slope instability and

slumping of the seacliff face. Therefore, much of Cayucos is either low-lying around the downtown or includes bluff top homes with minimal setbacks, and is therefore classified as “moderate to high risk” with respect to both existing coastal hazards and possible future coastal flooding and accelerated bluff retreat associated with sea level rise. Overall, coastal storm, coastal erosion, and sea level rise hazards have been rated by the planning team as holding **Medium Significance** for the District.

As part of the 2019 HMP planning effort, a sea level rise risk assessment was completed to determine how sea level rise may affect coastal jurisdictions and critical facilities and how coastal flooding might be exacerbated in the future. The only critical facility that would be affected by sea level rise is the Cayucos Fire Station which is at risk in a sea level rise scenario of 25 cm or greater. Table Q.6 and Table Q.7 summarize the other properties at risk of inundation by sea level rise and sea level rise combined with a 1% annual chance coastal flood. The area of inundation by sea level rise and sea level rise combined with the 1% coastal flood are shown in Figure Q.2 and Figure Q.3, respectively. See subsection 5.3.7 Coastal Storm/Coastal Erosion/Sea Level Rise in the base plan for more details on the scenarios and data sources used for this analysis.

Table Q.6 Properties Inundated by Sea Level Rise and Sea Level Rise with 1% Annual Chance Flood

Property Type	25-cm SLR	75-cm SLR	300-cm SLR	25-cm SLR w/ 1% Flood	75-cm SLR w/ 1% Flood	300-cm SLR w/ 1% Flood
Commercial	--	--	15	1	2	19
Government/Utilities	--	--	11	4	6	14
Other/Exempt/Misc.	--	--	10	1	3	12
Residential	--	--	46	2	12	83
Multi-Family Residential	--	1	16	3	3	28
Residential: Other	--	--	6	--	1	8
Vacant	--	--	3	--	--	3
Total	--	1	107	11	27	167

Source: Wood analysis with USGS CoSMoS 3.1 data

Table Q.7 Improved Values of Properties Inundated by Sea Level Rise and Sea Level Rise with 1% Annual Chance Coastal Flood

Property Type	25-cm SLR	75-cm SLR	300-cm SLR	25-cm SLR w/ 1% Flood	75-cm SLR w/ 1% Flood	300-cm SLR w/ 1% Flood
Commercial	--	--	\$3,409,945	\$236,199	\$448,106	\$5,320,935
Government/Utilities	--	--	\$0	--	--	\$169,629
Other/Exempt/Misc.	--	--	\$4,823,088	\$225,000	\$225,000	\$6,418,638
Residential	--	--	\$11,574,166	\$396,221	\$4,749,687	\$21,631,681
Multi-Family Residential	--	\$125,465	\$2,714,230	\$693,107	\$693,107	\$5,255,830
Residential: Other	--	--	\$4,598,565	\$860,108	\$860,108	\$5,444,156
Vacant	--	--	\$104,355	--	--	\$104,355
Total	\$0	\$125,465	\$27,224,349	\$1,550,527	\$6,976,008	\$44,327,224

Source: Wood analysis with USGS CoSMoS 3.1 data

Figure Q.2 Cayucos Sanitary District Sea Level Rise Scenario Analysis: Tidal Inundation Only

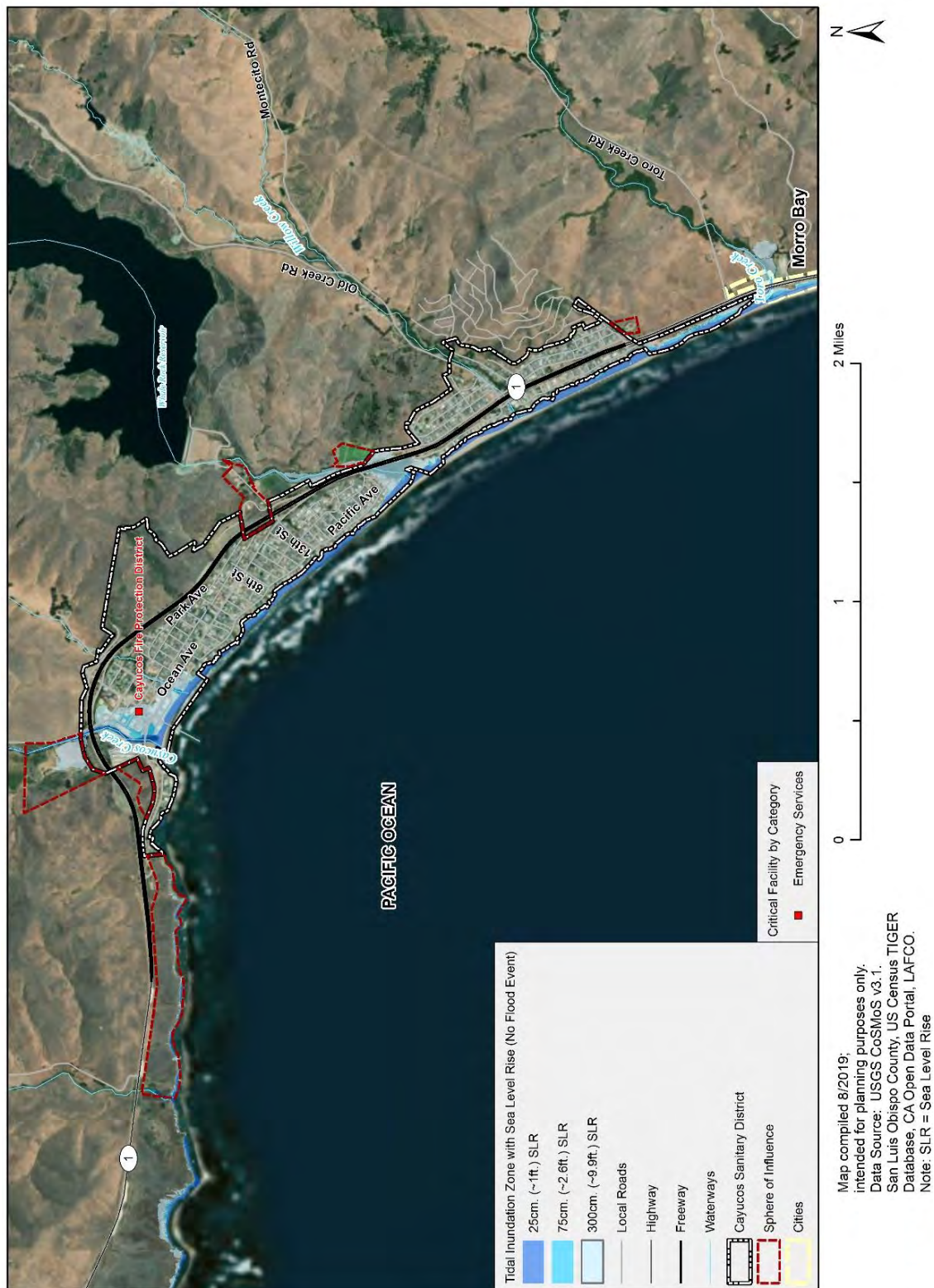
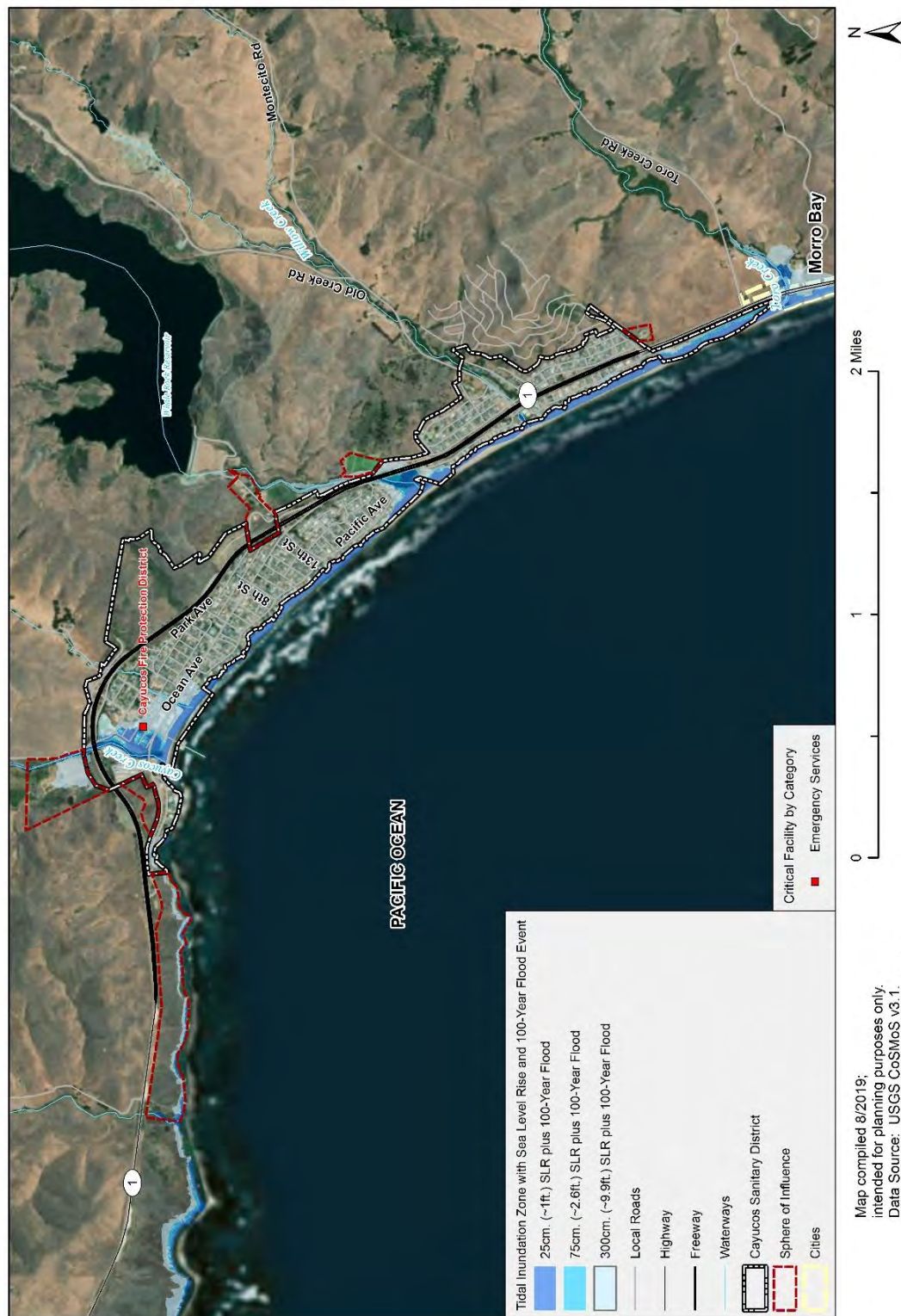


Figure Q.3 Cayucos SD Sea Level Rise Scenario Analysis: Tidal Inundation and 1% Annual Chance Flood



Earthquake

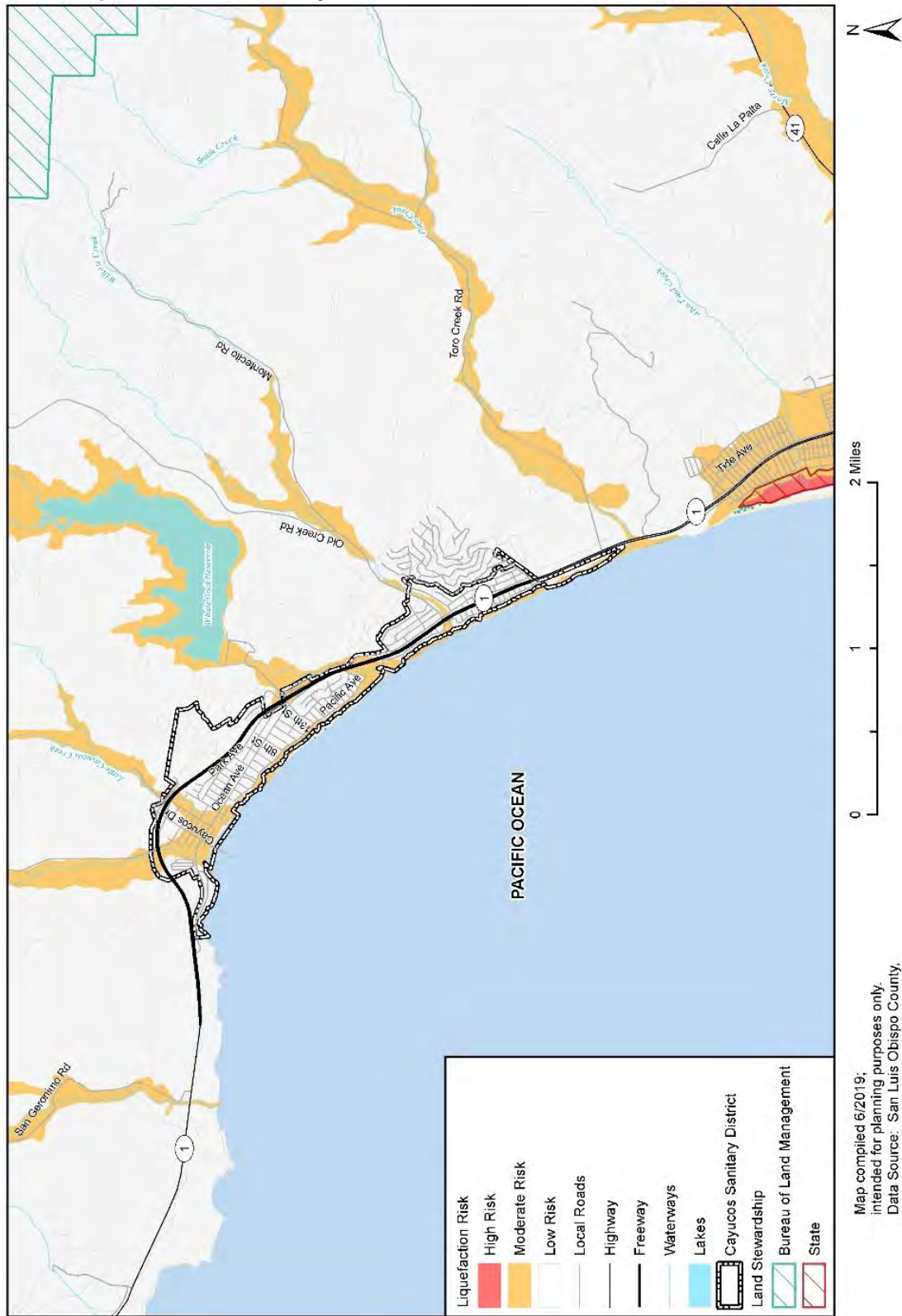
The central coast region of California has a long history of damaging earthquakes. Large earthquakes can originate from the San Andreas fault system and ground shaking can potentially affect the District. Soils in the low bluffs and along riparian corridors of Cayucos are subject to moderate liquefaction risk due to seismic activity. There are 285 parcels within the District that are subject to moderate liquefaction risk; no parcels are located within a high liquefaction risk area (Table Q.8). Structures on liquefiable soils indicated in Figure Q.4 below may be subject to increased damage. There is also one critical facility (the Cayucos Fire Protection District facility) found within moderate risk liquefiable soils. Overall, earthquake and liquefaction hazards have been rated by the planning team as holding **High Significance** for the District.

Table Q.8 Liquefaction Risk by Parcel Type in Moderate Risk Areas in the District

Parcel Type	Parcel Count	Improved Value	Content Value	Total Value
Commercial	19	\$5,302,935	\$5,302,935	\$10,605,870
Government/Utilities	19	\$169,629	--	\$169,629
Other/Exempt/Misc.	12	\$7,809,818	--	\$7,809,818
Residential	196	\$51,325,504	\$25,662,752	\$76,988,256
Multi-Family Residential	29	\$5,698,137	\$2,849,069	\$8,547,206
Residential: Other	6	\$4,598,565	\$2,299,283	\$6,897,848
Vacant	4	\$482,355	--	\$482,355
Total	285	\$75,386,943	\$36,114,038	\$111,500,981

Source: Wood Plc analysis based on ParcelQuest, San Luis Obispo County Assessor's Office data, and LAFCO data

Figure Q.4 Liquefaction Risks in Cayucos



Flood

Flood hazard areas in Cayucos occur along waterways and water bodies such as the Whale Rock Reservoir. Drainage concerns in Cayucos involve stormwater runoff and associated mudflows from the steeper slopes within and above the eastern portions of the community, as well as localized flooding from stormwater runoff in other areas. Cumulative drainage and geologic effects of existing and new development in these areas should be studied and mitigated on an areawide basis. The floodplains of Cayucos Creek, Little Cayucos Creek and Willow Creek are limited to areas immediately adjacent to the creek channels and estuaries. In the event of the failure of Whale Rock dam, areas along the Old Creek channel would be subject to flooding and damage. Cayucos experienced District-wide flooding due to multiple storm events in January and February 2017. These storm events resulted in \$30,000 in infrastructure damage incurred due to flooding, and acquired \$26,847 in federal and state disaster relief funding to help mitigate the cost of damage. There are 54 parcels vulnerable to a 100-year flood event, which potentially totals \$4,111,740 in estimated losses, as well as 56 parcels within the 500-year floodplain with over \$5 million in estimated losses (Table Q.9). A total of 6 government/utilities parcels fall in the coastal (VE) floodplain, but no monetary losses can be estimated from these given they are exempt properties. Figure Q.5 shows the flooded parcels in Cayuco as well as the floodplains discussed herein. There is one fire station (the Cayucos Fire Protection District facility) found within the 500-year floodplain, so that facility is at risk of flooding hazards. Overall, flooding hazards have been rated by the planning team as holding **High Significance** for the District.

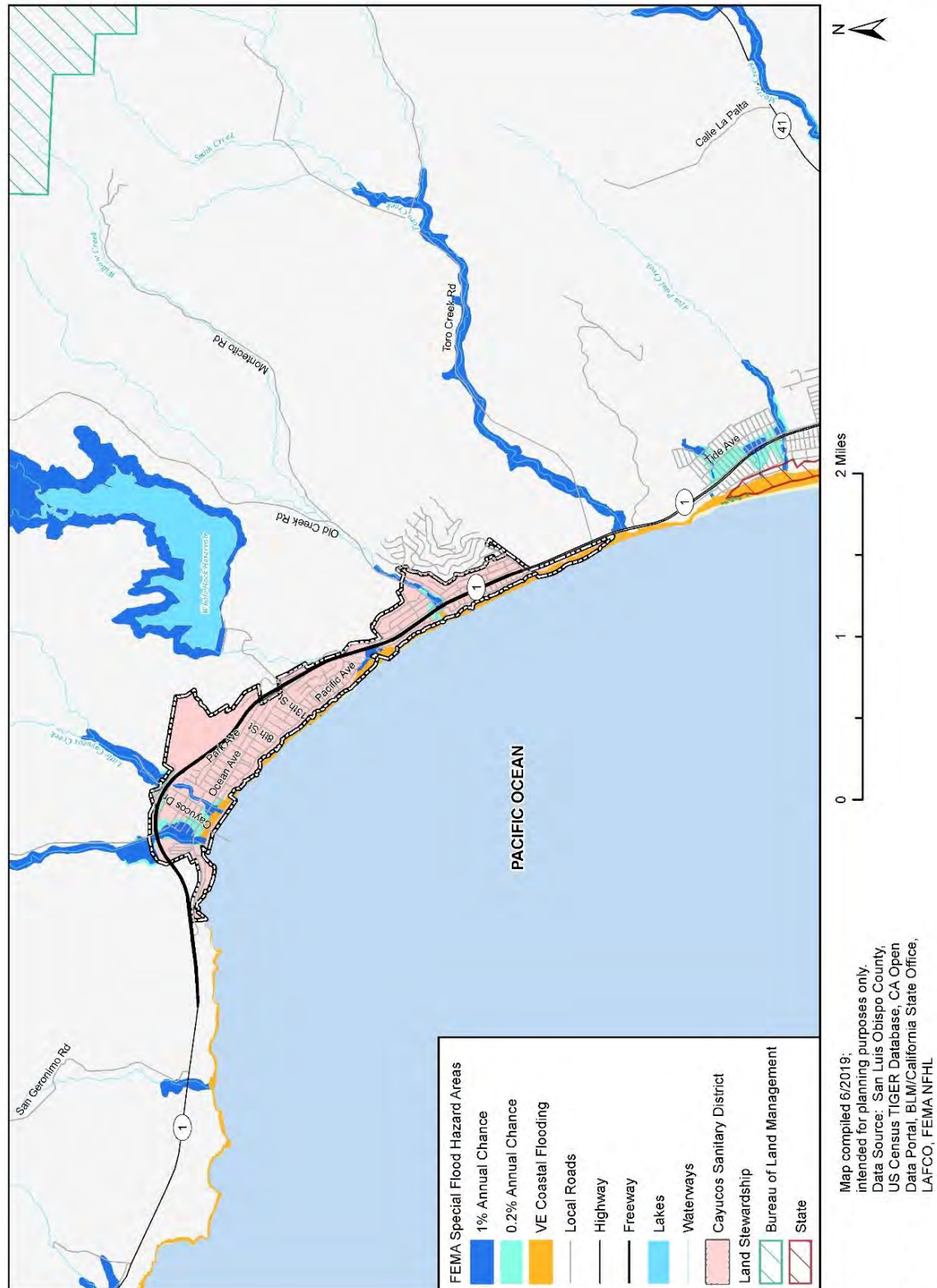
Cayucos SD does not participate separately in the National Flood Insurance Program (NFIP) but will continue to support the County's participation in and compliance with the NFIP.

Table Q.9 Flood Risk by Property Type

Property Type	Property Count	Improved Value	Content Value	Total Value	Loss Estimate
100-YEAR FLOOD EVENT					
Commercial	4	\$1,143,251	\$1,143,251	\$2,286,502	\$571,626
Government/Utilities	6	--	--	\$0	\$0
Other/Exempt/Misc.	4	\$1,612,620	--	\$1,612,620	\$403,155
Residential	24	\$5,890,886	\$2,945,443	\$8,836,329	\$2,209,082
Multi-Family Residential	15	\$2,458,679	\$1,229,340	\$3,688,019	\$922,005
Vacant	1	\$23,490	--	\$23,490	\$5,873
TOTAL	54	\$11,128,926	\$5,318,034	\$16,446,960	\$4,111,740
500-YEAR FLOOD EVENT					
Commercial	12	\$2,284,247	\$2,284,247	\$4,568,494	\$1,142,124
Government/Utilities	5	--	--	\$0	\$0
Other/Exempt/Misc.	6	\$2,769,376	--	\$2,769,376	\$692,344
Residential	21	\$4,047,568	\$2,023,784	\$6,071,352	\$1,517,838
Multi-Family Residential	4	\$674,995	\$337,498	\$1,012,493	\$253,123
Residential: Other	5	\$4,129,910	\$2,064,955	\$6,194,865	\$1,548,716
Vacant	3	\$204,365	--	\$204,365	\$51,091
TOTAL	56	\$14,110,461	\$6,710,484	\$20,820,945	\$5,205,236
COASTAL (VE) FLOOD EVENT					
Government/Utilities	6	--	--	--	--
TOTAL	6	--	--	--	--

Source: Wood Plc analysis based on ParcelQuest, San Luis Obispo County Assessor's Office data, LAFCO, and FEMA NFHL data

Figure Q.5 FEMA Flood Hazard Areas in Cayucos Sanitary District



Landslides and Debris Flow

There are 99 parcels within the District that are subject to very high landslide risk, 773 parcels subject to high landslide risk, and 5 parcels subject to moderate landslide risk (Table Q.10).

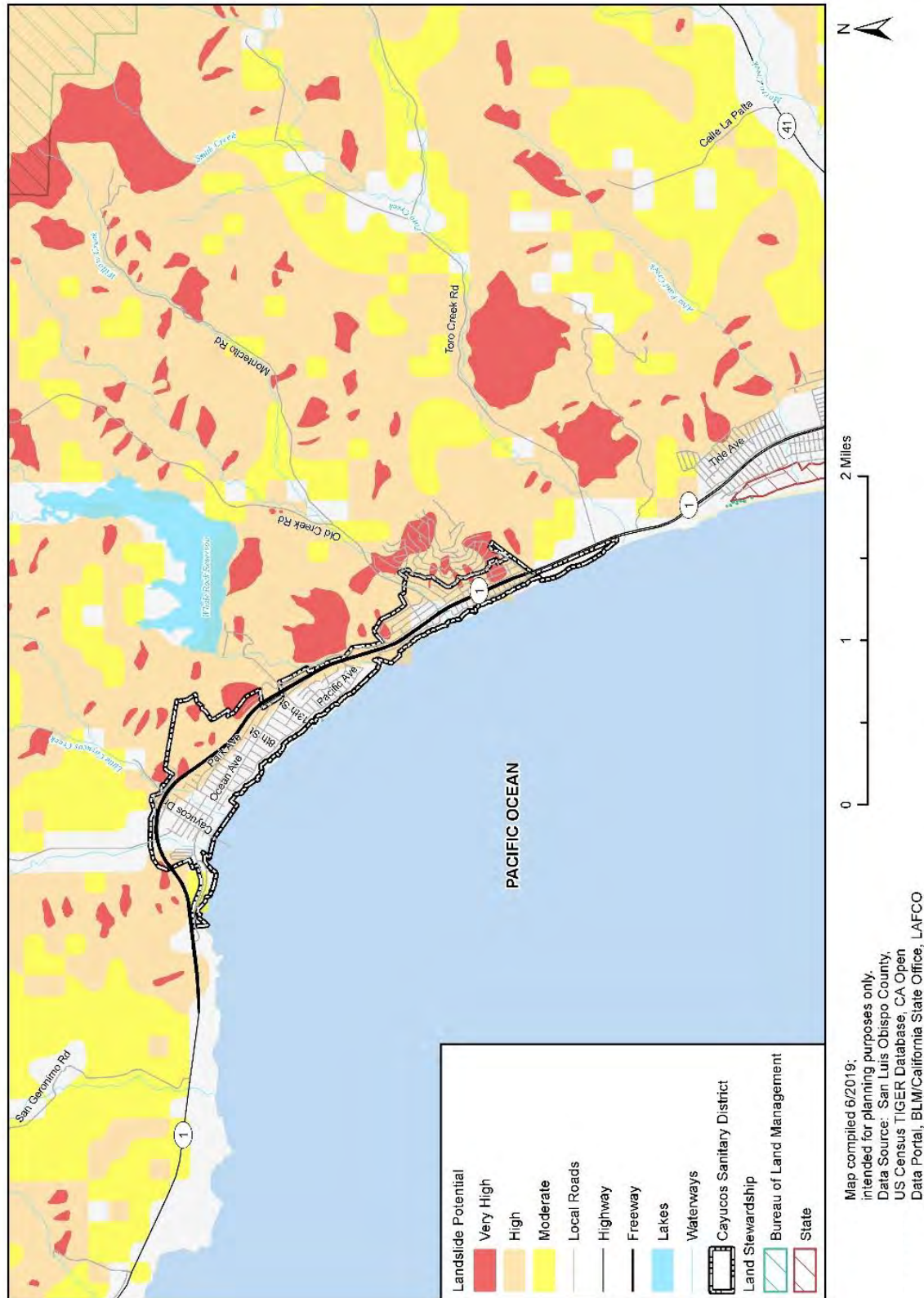
Figure Q.6 displays the various areas in the District subject to landslide potential. With regards to critical facilities, two have been found to overlap with high landslide potential areas. These are the combined California Department of Forestry and Fire Protection Station 11 (Cayucos Fire Station). Overall, landslide and debris flow hazards have been rated by the planning team as holding Medium Significance for the District.

Table Q.10 Landslide Hazard by Location and Property Type

Property Type	Property Count	Improved Value	Content Value	Total Value
Moderate Landslide Potential				
Multi-Family Residential	1	\$151,513	\$75,757	\$227,270
Residential	4	\$2,209,931	\$1,104,966	\$3,314,897
Total	5	\$2,361,444	\$1,180,722	\$3,542,166
High Landslide Potential				
Government/Utilities	24	--	--	\$0
Mobile/Manufactured Homes	1	\$80,801	\$40,401	\$121,202
Multi-Family Residential	57	\$10,817,411	\$5,408,706	\$16,226,117
Other/Exempt/Misc.	20	\$62,467	--	\$62,467
Residential	659	\$152,312,548	\$76,156,274	\$228,468,822
Vacant	12	\$1,167,173	--	\$1,167,173
Total	773	\$164,440,400	\$81,605,380	\$246,045,780
Very High Landslide Potential				
Government/Utilities	1	--	--	\$0
Other/Exempt/Misc.	2	--	--	\$0
Residential	96	\$23,127,943	\$11,563,972	\$34,691,915
Total	99	\$23,127,943	\$11,563,972	\$34,691,915
GRAND TOTAL	877	\$189,929,787	\$94,350,074	\$284,279,861

Source: Wood Plc analysis based on ParcelQuest, San Luis Obispo County Assessor's Office data, and LAFCO

Figure Q.6 Landslide Potential Areas in Cayucos Sanitary District



Tsunami and Seiche

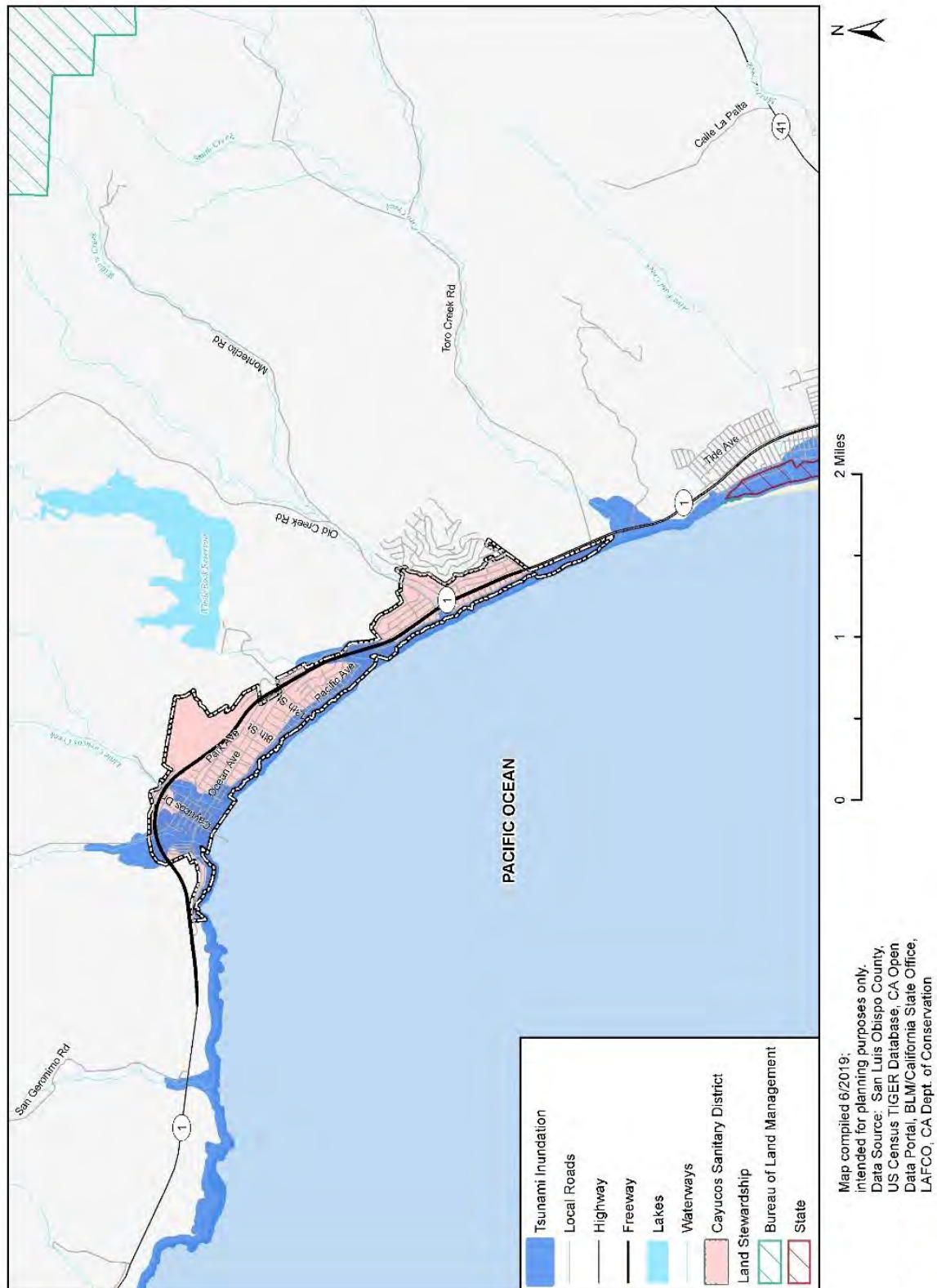
Tsunamis can be generated by offshore seismic activity and generate strong surges with the potential to damage and inundate coastal areas. Tsunamis generally affect coastal communities and low-lying waterways in the vicinity of the coast. Cayucos varies from narrow sandy beaches backed by undeveloped bluffs and sea cliffs, to wider sandy beaches backed by relatively low-lying coastal development. This area is susceptible to wave run-up and flooding due to strong surges, including tsunamis (Figure Q.7). A total of 340 parcels within the District are in a tsunami inundation zone and subject to a total of \$122,278,313 in potential loss estimates (Table Q.11). One critical facility (the Cayucos Fire Protection District facility) falls within tsunami inundation zones. Overall, tsunami and seiche hazards have been rated by the planning team as holding **Medium Significance** for the District.

Table Q.11 Tsunami Risk by Property Type

Property Type	Property Count	Improved Value	Content Value	Total Value	Loss Estimate
Commercial	19	\$5,302,935	\$5,302,935	\$10,605,870	\$10,605,870
Government/Utilities	21	\$169,629	--	\$169,629	\$169,629
Other/Exempt/Misc.	15	\$8,310,702	--	\$8,310,702	\$8,310,702
Residential	204	\$51,882,713	\$25,941,357	\$77,824,070	\$77,824,070
Multi-Family Residential	69	\$11,414,905	\$5,707,453	\$17,122,358	\$17,122,358
Residential: Other	7	\$5,155,553	\$2,577,777	\$7,733,330	\$7,733,330
Vacant	5	\$512,355	--	\$512,355	\$512,355
Total	340	\$82,748,792	\$39,529,521	\$122,278,313	\$122,278,313

Source: Wood Plc analysis based on ParcelQuest, San Luis Obispo County Assessor's Office data, LAFCO, and the CA Department of Conservation data

Figure Q.7 Tsunami Inundation Areas in the Cayucos Sanitary District



Wildfire

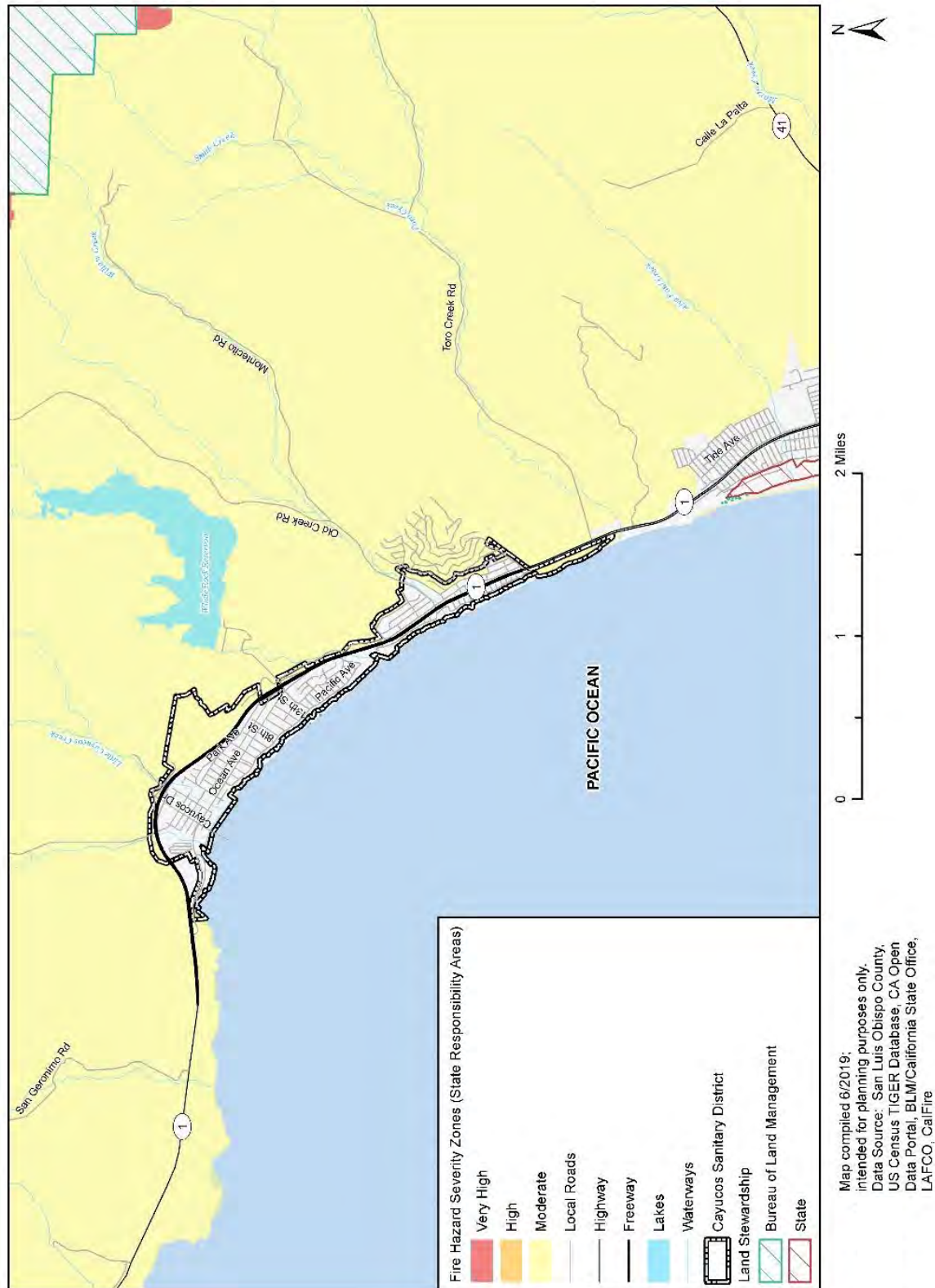
The FEMA Fire Hazard Severity Zones in Cayucos are moderate, and no properties exist within high or very high severity zones. The District is at risk of potential wildfire originating in the hills to the east, where high and very high severity zones occur. There are approximately 172 parcels located in the moderate wildfire severity hazard area, within the state responsibility area (Table Q.12). Two critical facilities are found within moderate wildfire severity hazard zones. These are the same facility, but classified as two different emergency service facilities since they serve two purposes: fire station, and emergency medical service stations. Overall, wildfire hazards have been rated by the planning team as holding **Medium Significance** for the District.

Table Q.12 Wildfire Severity by Property Type

Property Type	Property Count	Improved Value	Content Value	Total Value	Loss Estimate
Government/Utilities	23	--	--	\$0	\$0
Other/Exempt/Misc.	15	--	--	\$0	\$0
Residential	123	\$34,769,717	\$17,384,859	\$52,154,576	\$52,154,576
Multi-Family Residential	5	\$1,483,003	\$741,502	\$2,224,505	\$2,224,505
Residential: Other	3	\$825,609	\$412,805	\$1,238,414	\$1,238,414
Vacant	3	\$280,000	--	\$280,000	\$280,000
Total	172	\$37,358,329	\$18,539,165	\$55,897,494	\$55,897,494

Source: Wood Plc analysis based on ParcelQuest, San Luis Obispo County Assessor's Office data, LAFCO, and CalFire

Figure Q.8 Fire Hazard Severity Zones in Cayucos Sanitary District



Human Caused: Hazardous Materials

The Cal OES Warning Center reports 24 hazardous materials incidents in the Cayucos Sanitary District from 1994 through October 24, 2018; as noted in subsection 5.3.16 of the Base Plan, this likely excludes a large number of unreported minor spills. (Cal OES reports an additional 209 incidents in unincorporated San Luis Obispo County, however a lack of data makes it difficult to know if any of those took place within the District boundaries). This constitutes 1% of the hazardous materials incidents reported county-wide during the same time frame, and averages out to roughly 1.0 incidents per year. As noted in subsection 5.3.16 of the Base Plan, only around 6% of reported hazardous materials incidents result in injuries, fatalities, or evacuations. While there are no significant hazardous materials facilities located in the District, Cayucos sits within the Emergency Planning Zone for the Diablo Canyon Nuclear Power Plant. Overall, hazardous materials have been rated as holding **Low Significance** for the District, based on the Planning Team input.

Q.4 Capability Assessment

Capabilities are the programs and policies currently in use to reduce hazard impacts or could be used to implement hazard mitigation activities. This capability assessment is divided into five sections: regulatory mitigation capabilities, administrative and technical mitigation capabilities, fiscal mitigation capabilities, mitigation outreach and partnerships, and other mitigation efforts.

To develop this capability assessment, the jurisdictional planning representatives used a matrix of common mitigation activities to inventory policies and programs in place. The team supplemented this inventory by reviewing additional existing policies, regulations, plans, and programs to determine if they contributed to reducing hazard-related losses.

During the plan update process, this inventory was reviewed by the jurisdictional planning representatives and the Wood consultant team staff to update information where applicable and identify ways in which these capabilities have improved or expanded. In summarizing current capabilities and identifying gaps, the jurisdictional planning representatives also considered their ability to expand or improve upon existing policies and programs as potential new mitigation strategies. The Cayucos Sanitary District's updated capabilities are summarized below.

Q.4.1 Regulatory Mitigation Capabilities

Table Q.13 Cayucos Sanitary District Regulatory Mitigation Capabilities

Regulatory Tool	Yes/No	Comments
General plan	Yes	County
Zoning ordinance	Yes	County
Subdivision ordinance	Yes	County
Growth management ordinance	Yes	County
Floodplain ordinance	Yes	County
Other special purpose ordinance (stormwater, water conservation, wildfire)	Yes	County
Building code	Yes	County
Fire department ISO rating	Yes	County/Cal Fire
Erosion or sediment control program	Yes	County
Stormwater management program	Yes	County
Site plan review requirements	Yes	Cayucos Sanitary District
Capital improvements plan	Yes	Cayucos Sanitary District

Regulatory Tool	Yes/No	Comments
Economic development plan	Yes	County
Local emergency operations plan	Yes	County
Other special plans	Yes	District SSMP
Flood Insurance Study or other engineering study for streams	Yes	County
Elevation certificates (for floodplain development)	Yes	County
Other		

Q.4.2 Administrative/Technical Mitigation Capabilities

Table Q.14 Cayucos Sanitary District Administrative/Technical Mitigation Capabilities identifies the personnel responsible for activities related to mitigation and loss prevention in the Cayucos Sanitary District.

Table Q.14 Cayucos Sanitary District Administrative/Technical Mitigation Capabilities

Personnel Resources	Yes/No	Department/Position
Planner/engineer with knowledge of land development/land management practices	Yes	District Manager
Engineer/professional trained in construction practices related to buildings and/or infrastructure	Yes	District Manager
Planner/engineer/scientist with an understanding of natural hazards	Yes	Contract as needed
Personnel skilled in GIS	Yes	County
Full time building official	Yes	County
Floodplain manager	Yes	County
Emergency manager	Yes	District on-call personnel
Grant writer	Yes	Contract as needed
Other personnel	Yes	District Contructions and Maintenance
GIS Data Resources (Hazard areas, critical facilities, land use, building footprints, etc.)	Yes	County
Warning systems/services (Reverse 9-11, outdoor warning signals)	No	
Other		

Q.4.3 Fiscal Mitigation Capabilities

The District approves its Operating Budget and Capital Improvement & Equipment Budget in June for each Fiscal Year. Table Q.15 identifies financial tools or resources that the District could potentially use to help fund mitigation activities.

Table Q.15 Cayucos Sanitary District CSD Fiscal Mitigation Capabilities

Financial Resources	Accessible/Eligible to Use (Yes/No)
Community Development Block Grants	Yes
Capital improvements project funding	Yes
Authority to levy taxes for specific purposes	No
Fees for water, sewer, gas, or electric services	Yes
Impact fees for new development	Yes
Incur debt through general obligation bonds	Yes
Incur debt through special tax bonds	No
Incur debt through private activities	No
Withhold spending in hazard prone areas	No

Q.4.4 Mitigation Outreach and Partnerships

The County of San Luis Obispo conducted community outreach within the District's limits to receive feedback from stakeholders on outlined mitigation strategies within the SLO County Multi-Jurisdictional Hazard Mitigation Plan. The County of San Luis Obispo through CalFire provides services to the residents of the District including Emergency Medical Response (Estero Area Plan, 2009). The District utilizes the County Sheriff and California Highway Patrol for police services.

Q.4.5 Other Mitigation Efforts

The LPT noted the following mitigation efforts:

- The District conducts a yearly Fats, Oils and Grease (FOG) inspection program on commercial buildings to mitigate line clogs and potential for sewer backups.
- The District offers a no cost video inspection on private sewer laterals in order to eliminate stormwater drainage connections and leaking laterals.

Q.4.6 Opportunities for Enhancement

Based on the capabilities assessment, the District has several existing mechanisms in place that help to mitigate hazards. There are also opportunities for the District to expand or improve on these policies and programs to further protect the community. Future improvements may include providing training for staff members related to hazards or hazard mitigation grant funding in partnership with the County and Cal OES. Additional training opportunities will help to inform the District's staff members on how best to integrate hazard information and mitigation projects into their departments. Continuing to train staff on mitigation and the hazards that pose a risk to the District will lead to more informed staff members who can better communicate this information to the public.

Q.5 Mitigation Strategy

Q.5.1 Mitigation Goals and Objectives

The Cayucos Sanitary District adopts the hazard mitigation goals and objectives developed by the HMPC and described in Section 7 Mitigation Strategy.

Q.5.2 Mitigation Actions

The planning team for the Cayucos Sanitary District identified and prioritized the following mitigation actions based on the risk assessment. Actions were prioritized using the process described in subsection 7.2.1 of the Base

Plan. Background information and information on how each action will be implemented and administered, such as ideas for implementation, responsible office, potential funding, estimated cost, and timeline are also included. Actions with an '*' are those that mitigate losses to future development.

Table Q.16 Cayucos Sanitary District's Mitigation Action Plan

ID	Hazard(s) Mitigated	Description/Background/Benefits	Lead Agency and Partners	Cost Estimate	Potential Funding	Priority	Timeline	Status/ Implementation Notes
CAY.1	Adverse Weather, Coastal Storm/ Erosion/Sea Level Rise, Earthquake, Flood, Landslides and Debris Flow, Tsunami, Wildfire	Conduct a Critical Facility Audit and Monitoring to determine additional hazard risk and develop appropriate mitigation as applicable.	Cayucos Sanitary District	\$10,000 to \$50,00	District Budget	Medium	3-5 years	New
CAY.2	Adverse Weather, Coastal Storm/ Erosion/Sea Level Rise, Earthquake, Flood, Landslides and Debris Flow	Implement programmed improvements to pipelines and infrastructure as indicated in the Cayucos Sanitary District Capital Improvement yearly budget with a focus to build resiliency to multiple hazards including adverse weather, earthquakes, landslides, coastal storms, and flooding.	Cayucos Sanitary District	\$250,000 to \$350,000 per year	District Budget	High	Ongoing 2019-2025	New
CAY.3	Adverse Weather, Coastal Storm/ Erosion/Sea Level Rise, Earthquake, Flood, Landslides and Debris Flow, Tsunami	Relocation of Cayucos/Morro Bay WWTP to mitigate risk to coastal hazards, tsunami, and flood and enhance seismic resiliency in new facility.	Cayucos Sanitary District	\$25,000,000	USDA Loans and Grant Funding	High	2019-2021	New Construction is in progress in 2019. Plant is expected to be operational by end of 2020



Q.6 Implementation and Maintenance

Moving forward, the District will use the mitigation action table in the previous section to track progress on implementation of each project. Implementation of the plan overall is discussed in Section 8 in the Base Plan.

Q.6.1 Incorporation into Existing Planning Mechanisms

The information contained within this plan, including results from the Vulnerability Assessment and the Mitigation Strategy, will be used by the District to help inform updates and the development of local plans, programs and policies. The County Planning and Building Divisions may utilize the hazard information when reviewing a site plan or other type of development applications.

As noted in Section 8, the HMPC representatives from Cayucos will report on efforts to integrate the hazard mitigation plan into local plans, programs and policies and will report on these efforts at the annual HMPC plan review meeting.

Q.6.2 Monitoring, Evaluation and Updating the Plan

The Cayucos Sanitary District will follow the procedures to monitor, review, and update this plan in accordance with San Luis Obispo County as outlined in Section 8 of the Base Plan. Actions were prioritized using the process described in subsection 7.2.1 of the Base Plan. The Cayucos Sanitary District General Manager will be responsible for representing the District in related County Hazard Mitigation Plan meetings or events, and for coordination with County staff and departments during plan updates. The Cayucos Sanitary District realizes it is important to review the plan regularly and update it every five years in accordance with the FEMA Disaster Mitigation Act Requirements as well as other State of California requirements.



R.1 District Profile

R.1.1 Mitigation Planning History and 2019 Process

This Annex was created during the development of the 2019 San Luis Obispo County Hazard Mitigation Plan Update and is the first mitigation plan for the District. The Facilities Manager of the Port San Luis Harbor District (District) was the representative on the county Hazard Mitigation Plan Committee (HMPC) and took the lead for developing the plan this annex in coordination with the Port San Luis Harbor District Local Planning Team (LPT). The LPT will be responsible for implementation and maintenance of the plan.

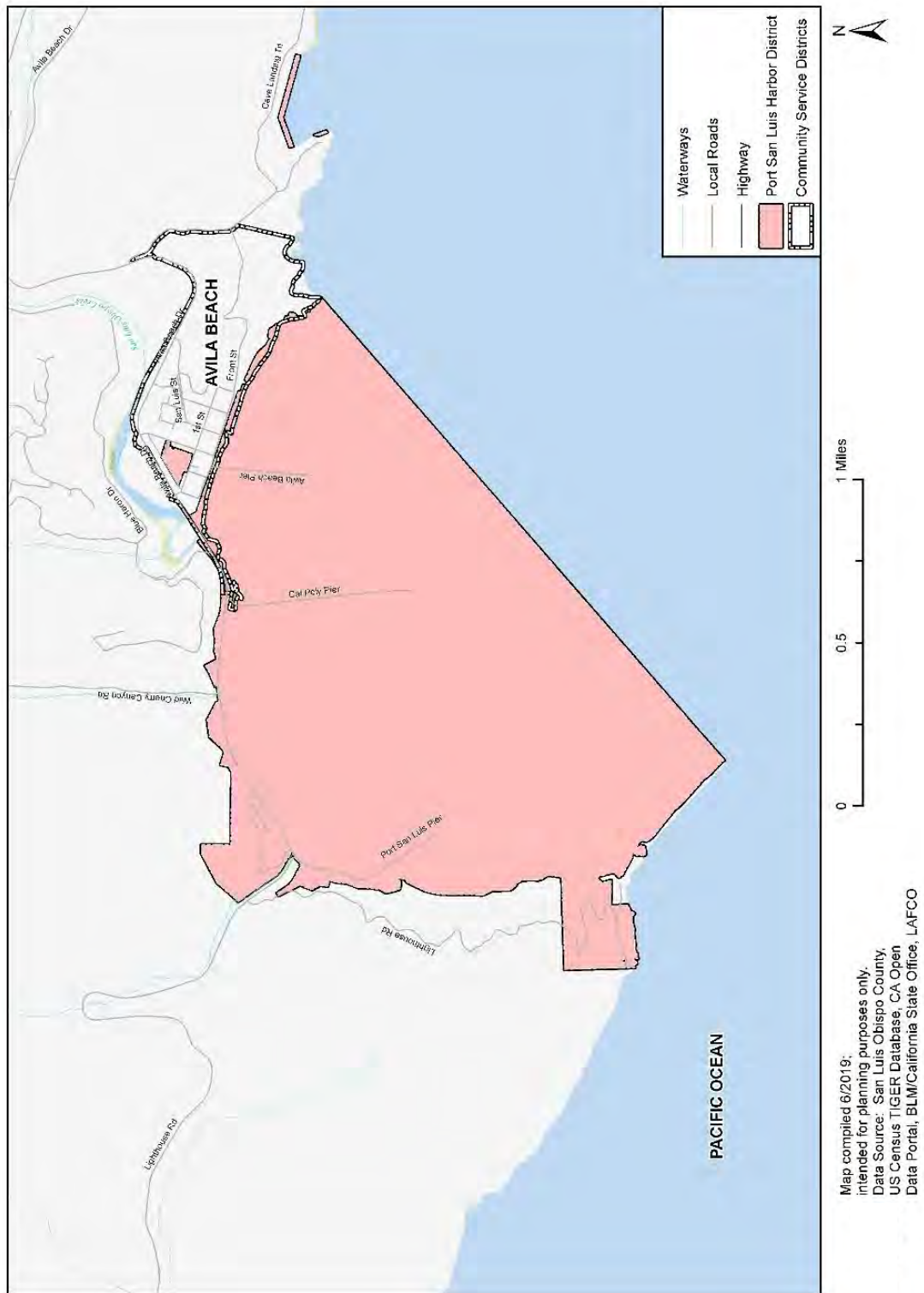
Table R.1 Port San Luis Harbor District Hazard Mitigation Plan Planning Team

Department or Stakeholder	Title
Port San Luis Harbor District	Facilities Manager

More details on the planning process followed and how the jurisdictions, service districts and stakeholders participated can be found in Section 3 of the Base Plan (Planning Process), as well as how the public was involved during the 2019 update.

Figure R.1 below shows the boundaries of the Port San Luis Harbor District.

Figure R.1 Port San Luis Harbor District



R.1.2 District Overview

The origins of Port San Luis began in 1868 when John Harford, a local entrepreneur, proposed building a wharf in the sheltered west side of San Luis Obispo Bay. The wharf, later to be named Harford Pier, was completed in 1873. Through its early years the Port was a key link to the County's dairy, grain, cattle, hogs, and other farm and mineral exports. When oil was discovered in San Luis Obispo County and northern Santa Barbara County, oil storage tanks were erected on a hillside north of the port, Harbor Terrace. After the standard-gauge Southern Pacific Railroad lines arrived along with the hardships of the Great Depression in the late 1920s, the port declined, and the oil facilities were abandoned; by the 1950s the pier was unable to support freight vehicles due to the extreme state of disrepair.

In 1954 the citizens of southern San Luis Obispo County voted to create and fund a Harbor District for the Port San Luis Area. It was hoped that this action would provide a means to fix up the old facilities and create some commerce for the south county. The State of California granted the Harbor District the tidelands of San Luis Obispo Bay, with boundaries of Point San Luis on the west, Irish Hills in the north, Sunset Palisades to the east, and the Ocean areas southward. The Harbor District acquired the Harford Pier in 1965 and began rehabilitating the pier to allow modern functions while preserving its historic character.

Since the mid-1960s the Port San Luis Harbor District has acquired additional properties, most of which have limited access due to the local topography. Current District owned properties span from the Point San Luis Lighthouse to Avila Beach. The Harbor District operates and maintains Harford Pier, Harford Landing, Avila Pier, Avila Beach, Avila Beach Parking Lot, Olde Port Beach, Fisherman's Beach, Point San Luis Lighthouse, and Harbor Terrace. The neighboring properties are used for agriculture for the most part, with the exception of the Diablo Canyon Nuclear Power Plant northwest of the Port. The Harbor Commission has since sought to implement the original goal of the first Commission and vision of the Founding Fathers of the District: to repair the facilities and become economically viable while serving the public. The District's mission statement overall is to "serve the public with an array of commercial and recreational boating, fishing and coastal related opportunities, while ensuring an environmentally responsible, safe, well-managed and financially sustainable harbor that preserves [the District's] marine heritage and character" (Port San Luis Harbor District website).

R.1.3 Development Trends

Port property mandates require consideration of the needs of harbor users alongside with the resources required to serve them (e.g. waterfront locations as well as capital and infrastructure improvements). Therefore, planning activities need to be implemented in smart ways which preserve environmental resources such as land and water ecosystems, scenic views, and the overall waterfront character of the Port. Some key planning issues which affect policy and development designs are: addressing District priorities and fiscal issues while meeting the needs of the harbor users (e.g. recreational activities), guaranteeing coastal access, and maintaining and preserving the environment (e.g. marine ecology). As such, future potential development may be limited but should retain the architecture and landscaping principles of the local waterfront character, while taking into account the aforementioned planning issues to reduce long term maintenance requirements. As such, proposed developments at the Port must always be within resource and system capabilities available to the District, while additionally meeting safety requirements. For more details on the specific limitations to development, ongoing issues with planning efforts, and the Port's overall short- and long-term objectives for the District and its management, refer to the Port San Luis Harbor District Master Plan revised in 2007.

R.1.4 Other Community Planning Efforts

Coordination and synchronization with other community planning mechanisms and efforts are vital to the success of this plan. To have a thorough evaluation of hazard mitigation practices already in place, appropriate

planning procedures should involve identifying and reviewing existing plans, policies, regulations, codes, tools, and other actions designed to reduce a community's risk and vulnerability from natural hazards.

The Port San Luis Harbor District is referenced in other County planning documents and regulated by County policies and planning mechanisms. Integrating existing planning efforts, mitigation policies, and action strategies into this Annex establishes a credible, comprehensive document that weaves the common threads of a community's values together. The development of this jurisdictional annex involved a comprehensive review of existing plans, studies, reports, and initiatives from San Luis Obispo County and the District that relate to hazards or hazard mitigation. A high-level summary of the key plans, studies and reports is summarized in Table R.1. Information on how they informed the update are noted and incorporated where applicable.

Table R.2 Summary of Review of Key Plans, Studies and Reports

Plan, Study, Report Name	How Document Informed the Annex
Port Master Plan (2004) – Revised in 2007	Pulled information on the Port's history, planning challenges, issues with hazards, and other such key issues.
Avila Community Plan, Background Report (2018)	Incorporated background information on the community and CSD including historical and cultural resources, and development and land use trends; incorporated hazard information and maps (if applicable) and informed the Vulnerability Assessment.
San Luis Bay Area Plan – Coastal (Revised August 2009)	Incorporated hazard information related to flooding and coastal hazards.
San Luis Obispo County – Tsunami Emergency Response Plan (Revised April 2016)	Informed the Vulnerability Assessment for tsunami risk.

R.2 Hazard Identification and Summary

The District's Planning Team identified the hazards that affect the District and summarized their frequency of occurrence, spatial extent, potential magnitude, and significance specific to the Port San Luis Harbor District (see Table R.3). There are no hazards that are unique to the Port San Luis Harbor District compared to the rest of the County.

Table R.3 Port San Luis Harbor District Hazard Risk Summary

Hazard	Geographic Area	Probability of Future Occurrence	Magnitude/Severity (Extent)	Overall Significance
Adverse Weather	Extensive	Highly Likely	Limited	Medium
Coastal Storms/Coastal Erosion/Coastal Flooding and Inundation/Sea Level Rise	Significant	Highly Likely	Limited	High
Earthquake and Liquefaction	Extensive	Likely	Critical	Medium
Flood	Limited	Highly Likely	Limited	Medium
Landslide and Debris Flows	Significant	Highly Likely	Critical	Medium
Tsunami and Seiche	Significant	Occasional	Catastrophic	High
Wildfire	Significant	Occasional	Critical	Medium
Human Caused: Hazardous Materials	Extensive	Unlikely	Catastrophic	High
Geographic Area Limited: Less than 10% of planning area Significant: 10-50% of planning area Extensive: 50-100% of planning area Probability of Future Occurrences Highly Likely: Near 100% chance of occurrence in next year or happens every year. Likely: Between 10 and 100% chance of occurrence in next year or has a recurrence interval of 10 years or less. Occasional: Between 1 and 10% chance of occurrence in the next year or has a recurrence interval of 11 to 100 years. Unlikely: Less than 1% chance of occurrence in next 100 years or has a recurrence interval of greater than every 100 years.		Magnitude/Severity (Extent) Catastrophic—More than 50 percent of property severely damaged; shutdown of facilities for more than 30 days; and/or multiple deaths Critical—25-50 percent of property severely damaged; shutdown of facilities for at least two weeks; and/or injuries and/or illnesses result in permanent disability Limited—10-25 percent of property severely damaged; shutdown of facilities for more than a week; and/or injuries/illnesses treatable do not result in permanent disability Negligible—Less than 10 percent of property severely damaged, shutdown of facilities and services for less than 24 hours; and/or injuries/illnesses treatable with first aid Significance Low: minimal potential impact Medium: moderate potential impact High: widespread potential impact		

R.3 Vulnerability Assessment

The intent of this section is to assess the Port San Luis Harbor District's vulnerability separately from that of the planning area, which has already been assessed in Section 5 Hazard Identification and Risk Assessment in the Base Plan. This vulnerability assessment analyzes the population, property, and other assets at risk to hazards ranked of medium or high significance as rated by the Planning Team.

The information to support the hazard identification and risk assessment for this Annex was collected through a Data Collection Guide, which was distributed to each participating municipality or special district to complete during the planning process. Information collected was analyzed and summarized in order to identify and rank all the hazards that could impact anywhere within the County, as well as to rank the hazards and identify the related vulnerabilities unique to each jurisdiction. The Port San Luis Harbor District planning team members were also asked to share information on past hazard events that have affected the District.

Each participating jurisdiction was in support of the main hazard summary identified in the Base Plan (see Table 5.2). However, the hazard summary rankings for each jurisdictional annex may vary slightly due to specific hazard risk and vulnerabilities unique to that jurisdiction (See Table R.3). Identifying these differences helps the reader to differentiate the jurisdiction's risk and vulnerabilities from that of the overall County.

Note: The hazard "Significance" reflects overall ranking for each hazard and is based on the Port San Luis planning team input from the Data Collection Guide and the risk assessment developed during the planning process (see section 5 of the Base Plan), which included a more detailed qualitative analysis with best available data.

The hazard summaries in Table R.3 reflect the hazards that could potentially affect the District. Based on this analysis, the priority hazards (High Significance) for mitigation are coastal hazards (coastal storm/coastal erosion/coastal flooding and inundation/sea level rise) along with hazardous materials. The discussion of vulnerability for each of the following hazards is in subsection R.3.2 Estimating Potential Losses. Those of Medium or High significance for the Port San Luis Harbor District are identified below.

- Adverse Weather
- Coastal Storm/Coastal Erosion/Coastal Flooding and Inundation/Sea Level Rise
- Earthquake and Liquefaction
- Flood
- Landslide and Debris Flows
- Tsunami and Seiches
- Wildfire
- Human Caused: Hazardous Materials

Other Hazards

Hazards assigned a significance rating of Low or N/A (Not Applicable) are not addressed further in this annex and are not assessed individually for specific vulnerabilities in this section. The District's Planning Team decided to rate several hazards as N/A or Low due to a lack of exposure, vulnerability, or no probability of occurrence. The following hazards are considered Low significance hazards or Not Applicable (N/A) to the Port San Luis Harbor District.

- Dam Failure – N/A
- Agricultural Pests and Plant Diseases - Low
- Biological Agents - Low
- Drought – Low
- Hazardous Trees – Low
- Land Subsidence – Low
- Radon Hazards – Low

R.3.1 Assets at Risk

This section considers the District's assets at risk, including values at risk, critical facilities and infrastructure, historic assets, economic assets, and growth and development trends.

Values at Risk

The following data on property exposure is derived from the San Luis Obispo County Assessor data. This data should only be used as a guideline to overall values in the District as the information has some limitations. Table R.4 shows the exposure of parcels (e.g., the values at risk based on improvement values, content values, and

total values as an addition of these two types of values) broken down by parcel type for the Port San Luis Harbor District. Note that much of the inventory is exempt from tax assessment, thus the assessor data did not have valuations on property within the district. In lieu of this the District provided a property inventory based on scheduled items with the Special District Risk Management Authority. The total value of these assets as of July 2019 is \$40,334,089 in improvements and \$919,189 in contents. Details by asset type are provided in an attachment to this annex.

Table R.4 Parcel Exposure Values for the Port San Luis Harbor District by Parcel Types

Property Type	Parcel Count	Building Count	Improved Value
Government/Utilities	13	--	NA
Other/Exempt/Misc.	2	--	NA
Total	15	--	

Source: Wood Plc analysis based on ParcelQuest and San Luis Obispo County Assessor's Office data

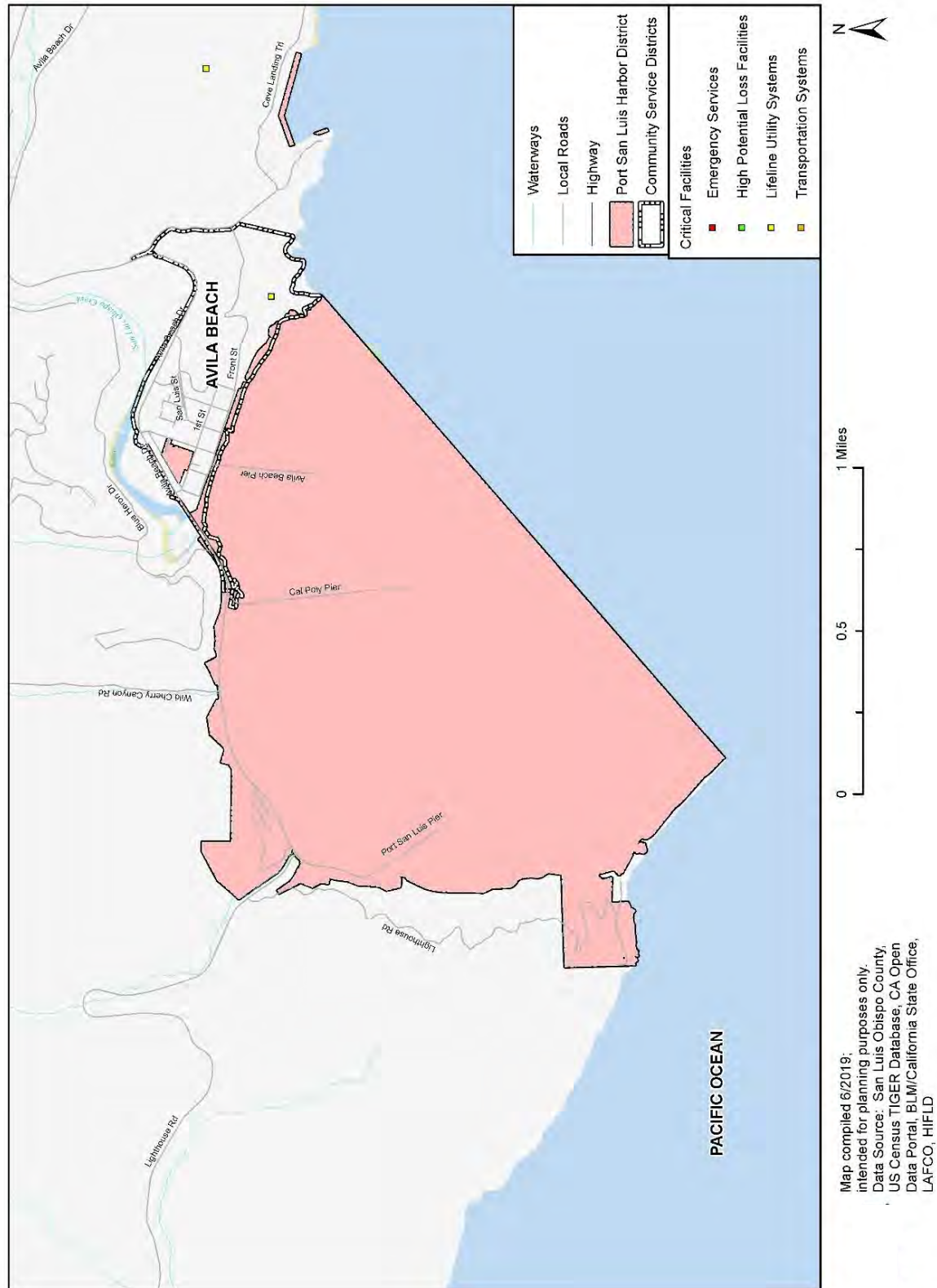
Critical Facilities and Infrastructure

A critical facility is one that is essential in providing utility or direction either during the response to an emergency or during the recovery operation. See Section 5 of the Base Plan for more details on the definitions and categories of critical facilities.

An inventory of critical facilities in the County based on San Luis Obispo County GIS data as well as structures obtained from the Homeland Infrastructure Foundation-Level Dataset (HIFLD) is provided in subsection 5.2 Asset Summary of the Base Plan. The four types of Critical Facilities categorized by San Luis Obispo County and its jurisdictions' and districts' planning teams are: Emergency Services, High Potential Loss Facilities, Lifeline Utility Systems, and Transportation Systems. Refer to subsection 5.2 of the Base Plan for more information on the assets used throughout this Annex and the county-wide analyses. While there are no critical facilities associated with these databases within the Port San Luis Harbor District boundaries that are vulnerable to hazards in the planning area, nearby facilities in Avila Beach and east of the Port are displayed in Figure R.2. Information provided by the District in the attachment to this annex indicates the following critical facilities:

- Water Tank/Domestic Well
- Water Tower 100k. gal/Booster Pump
- Sewer lift stations (5)
- Diesel Facility/Pump Out

Figure R.2 Critical Facilities Near the Port San Luis Harbor District



Transportation and Lifeline Facilities

There is only one main way in and out of the Port District and Avila Beach by automobile. Avila Beach Drive is the main transportation waypoint and, if obstructed or out of service (e.g., when closed down for repairs or due to hazard events such as the landslide which took place about around 2009), access to the port and Avila Beach become severely limited unless traveling by foot.

Because the Diablo Canyon Nuclear Power Plant is mainly accessible through this road, access issues are of importance to the nearby communities due to reliance on this primary road which may become unavailable and hence prevent hundreds of cars from travelling to and from the nuclear plant. During a hazard or serious emergency event it would be required to provide fast and unrestricted access to critical services (e.g. firefighting), and so emergency responders could face serious impediments during a critical situation if this main road becomes difficult or impossible to traverse on the way to or from the nuclear plant.

High Potential Loss Facilities

The Diablo Canyon Nuclear Power Plant is located north of the Diablo Canyon Road, accessible through Avila Beach and the Harbor District via Avila Beach Drive.

Historic and Cultural Resources

The Port San Luis Harbor District manages Port San Luis Harbor, which serves the public with commercial and recreational boating, fishing, and coastal-related opportunities. The Port San Luis Harbor includes Harford Pier, Harbor terrace, Fishermen's Beach, Port Beach, Cal Poly Research Pier, a historic lighthouse, Avila Pier, Avila Beach, and Pirate's Cove, among some of the prominent cultural and relevant community resources (Avila Community Plan, 2018).

Natural Resources

Ecological assets have been historically of high importance to the Harbor District community, as indicated in the District's Master Plan. Assets such as the beach and bluffs, open waters, and species diversity are critical to the District and surrounding communities.

Economic Assets

The port, beaches, piers, campgrounds, and other assets the Harbor District manages are in themselves main assets for the community, as it generates profits from tourists and other populations visiting the area and its environmental and natural amenities. In addition, the Diablo Canyon plant is an economic asset near the Port, on which many locals rely for jobs and to sustain the local economy.

R.3.2 Estimating Potential Losses

This section details vulnerability to specific hazards of medium or high significance, where quantifiable, noted by the Planning Team, and/or where it differs significantly from that of the overall County. Impacts of past events and vulnerability to specific hazards are further discussed below, though refer to Section 5 of the Base Plan for more details on the County's HIRA findings and hazard profiles.

Adverse Weather

Adverse weather involves thunderstorms, heavy rain, hail, lightning, dense fog, freeze, high winds, tornadoes, and extreme heat events. In the District, these hazards have been known to occur given the District's location on the coast and hence the climatic and weather variability with seasonable changes, tides, and ocean currents.

Adverse weather hazards pose a **Medium Significance** hazard, per the District's local planning team. The District

is subject to frequent and strong southerly winds during fall and winter months, ranging from 32 to 46 mph, with gusts sometimes reaching 55-65 mph. Santa Lucia winds are also common within the District, typically producing northeasterly winds that range from 15 to 35 mph, and sometimes reaching 40 mph. Extreme heat events are infrequent, but higher temperatures that are sustained during summer months put staff working outdoors for extended periods at an increased risk of heat illness and heat-related injuries. The District has experienced lightning storms in the past, which poses a potential fire hazard for the two wooden piers within San Luis Bay. Dense fog, a common element of shorelines and harbors during the early mornings of cooler months, also poses significant risks for boaters on the water. Low visibility caused by dense fog may lead to damage of boats and other structures in the event of a collision.

Actions to mitigate other adverse weather elements—such as thunderstorms, heavy rain, and tornadoes—are incorporated into actions that address coastal storms and flooding. More specifics on coastal storms and sea level rise issues are discussed in the following sections of this annex. For more details on overall adverse weather hazards and historical events, refer to Subsection 5.3.1 of the Base Plan.

Coastal Storm/Coastal Erosion/Coastal Flooding and Inundation/Sea Level Rise

As a low-lying coastal and port community, the Port San Luis Harbor District is exposed to a range of coastal hazards, including coastal storms and coastal erosion. As described in the Base Plan (refer to subsection 5.3.7), these hazards are projected to become more severe when combined with sea level rise. The District and its direct surroundings, such as Avila Beach, have dealt with the aftermath of coastal storms in past events.

The District has ranked these coastal hazards along with sea level rise as holding **High Significance**. Based on planning team input, damages from storm waves and southerly storms occur with high frequency. In addition, there are FEMA-provided flood hazard areas along the coast, which fall under the detailed study coastal flooding, Table R.5 below summarizes the parcels which flood under this FEMA hazard area category (i.e. zone VE). These coastal hazards have been mitigated slightly through coastal armoring, including a series of bluff and sea walls between Front Street and shoreline in Avila Beach just to the east of the District. Because of this armoring it is expected the community will experience lesser impacts of bluff erosion compared to other coastal communities.

Table R.5 **Parcels in Coastal/VE Flood Hazard Areas in the Port San Luis Harbor District**

Parcel Type	Parcel Count	Improved Value	Content Value	Total Value	Loss Estimate
Government/Utilities	7	--	--	--	--
Other/Exempt/Miscellaneous	1	--	--	--	--
TOTAL	8	--	--	--	--

Source: San Luis Obispo County Planning and Building Dept., Assessor's Office, ParcelQuest, FEMA NFHL, Wood Plc Parcel Analysis

Rising sea level due to climate change is projected to increase the intensity of coastal storms, flooding, inundation, and erosion along the District's coast. The areas with the highest potential of experiencing coastal hazards include the shoreline, cliffs, and low-lying areas adjacent to the nearby waterways which are already vulnerable to riverine flooding without the rising sea levels. The local planning team also noted that the District is very susceptible to southerly storms, and a second breakwater never being constructed left the harbor partially completed. Often a number of boats along the beach will cause damages to the pier during large coastal storms, and the District government wishes to focus on the redesign of the pier including pier materials if the infrastructure were to fail due to sea level rise issues. For example, the Avila Pier nearby has been partially destroyed three times in the last 150 or so years. A revetment and jetty at the Harford Landing also require repairs, since their current heights make them susceptible to damages during the winter. The planning team

hopes to be able to add a small seawall atop of the revetment to defend against winter waves and climate change/sea level rise effects, which are expected to worsen over the years.

With regards to transportation systems and related local infrastructure, the Avila Beach Drive road floods during storms due to the local creek systems and often becomes impassable. As this road is critical in nature, being the only main way in and out the area by automobile, these hazard events pose high risks to the District. In addition, portions of Avila Beach such as the parking lot are likely to inundate frequently. The current one-way duckbill valve which is supposed to drain to the creek nearby has experienced multiple issues, as the low-lying areas are often flooded in the winter months along Beach Colony Lane. With a changing climate, these issues are expected to worsen the impacts on local infrastructure.

As part of the 2019 HMP planning effort, a sea level rise risk assessment was completed to determine how sea level rise may affect coastal jurisdictions and critical facilities and how coastal flooding might be exacerbated in the future. Table R.6 and Table R.7 summarize the properties at risk of inundation by sea level rise and sea level rise combined with a 1% annual chance coastal flood. The area of inundation by sea level rise and sea level rise combined with the 1% coastal flood are shown in Figure R.3 and Figure R.4, respectively. No critical facilities were determined to be at risk in the sea-level rise scenarios. See subsection 5.3.7 Coastal Storm/Coastal Erosion/Sea Level Rise in the base plan for more details on the scenarios and data sources used for this analysis.

Table R.6 Properties Inundated by Sea Level Rise and Sea Level Rise with 1% Annual Chance Flood

Property Type	25-cm SLR	75-cm SLR	300-cm SLR	25-cm SLR w/ 1% Flood	75-cm SLR w/ 1% Flood	300-cm SLR w/ 1% Flood
Government/Utilities	1	2	5	2	4	5
Other/Exempt/Misc.	--	--	1	--	--	1
Total	1	2	6	2	4	6

Source: Wood analysis with USGS CoSMoS 3.1 data

Table R.7 Improved Values of Properties Inundated by Sea Level Rise and Sea Level Rise with 1% Annual Chance Flood

Property Type	25-cm SLR	75-cm SLR	300-cm SLR	25-cm SLR w/ 1% Flood	75-cm SLR w/ 1% Flood	300-cm SLR w/ 1% Flood
Government/Utilities	--	\$8,491,063	\$26,689,968	\$8,491,063	\$8,491,063	\$26,689,968
Other/Exempt/Misc.	--	--	--	--	--	--
Total	\$0	\$8,491,063	\$26,689,968	\$8,491,063	\$8,491,063	\$26,689,968

Source: Wood analysis with USGS CoSMoS 3.1 data

Figure R.3 Port San Luis Harbor District Sea Level Rise Scenario Analysis: Tidal Inundation Only

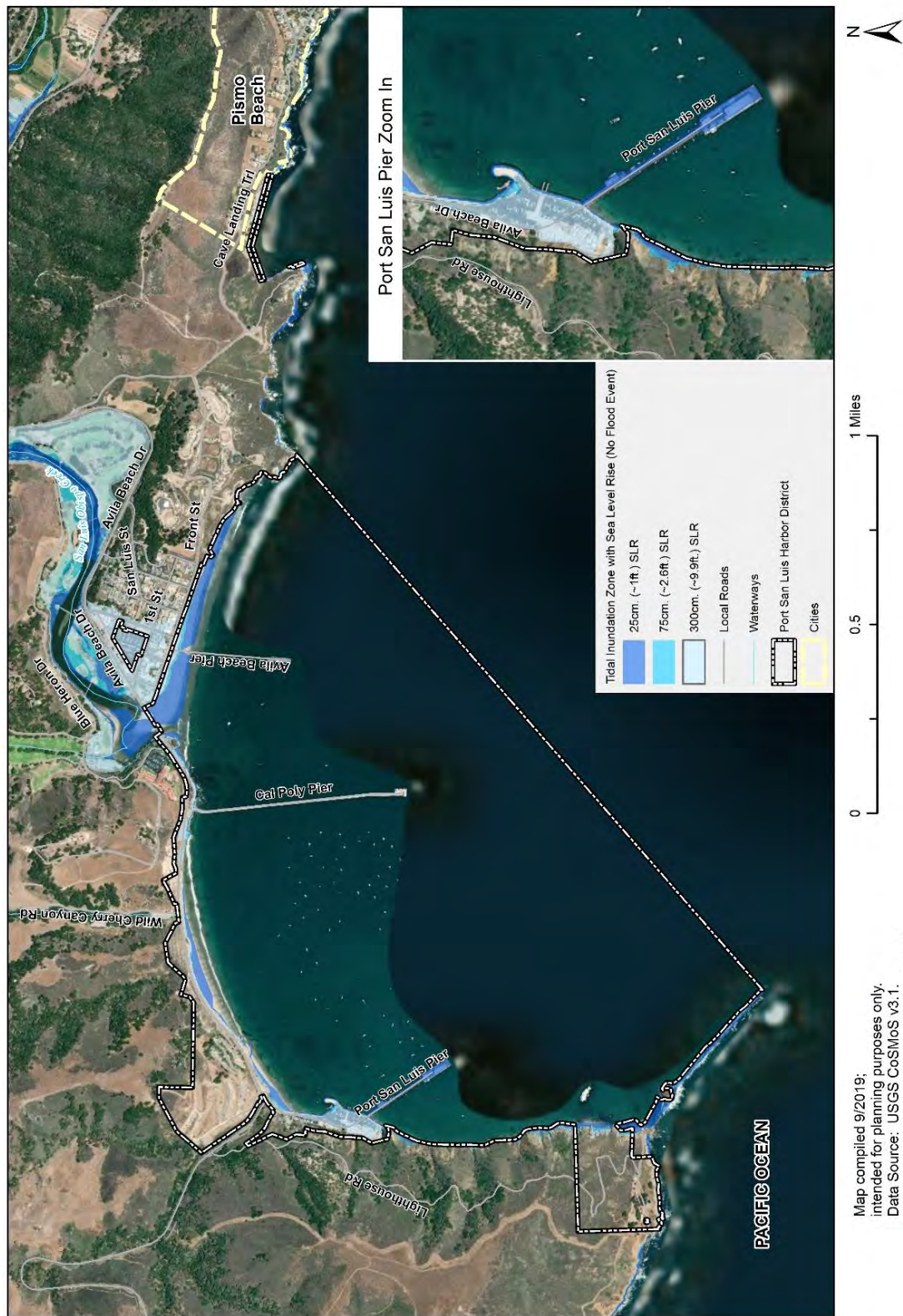
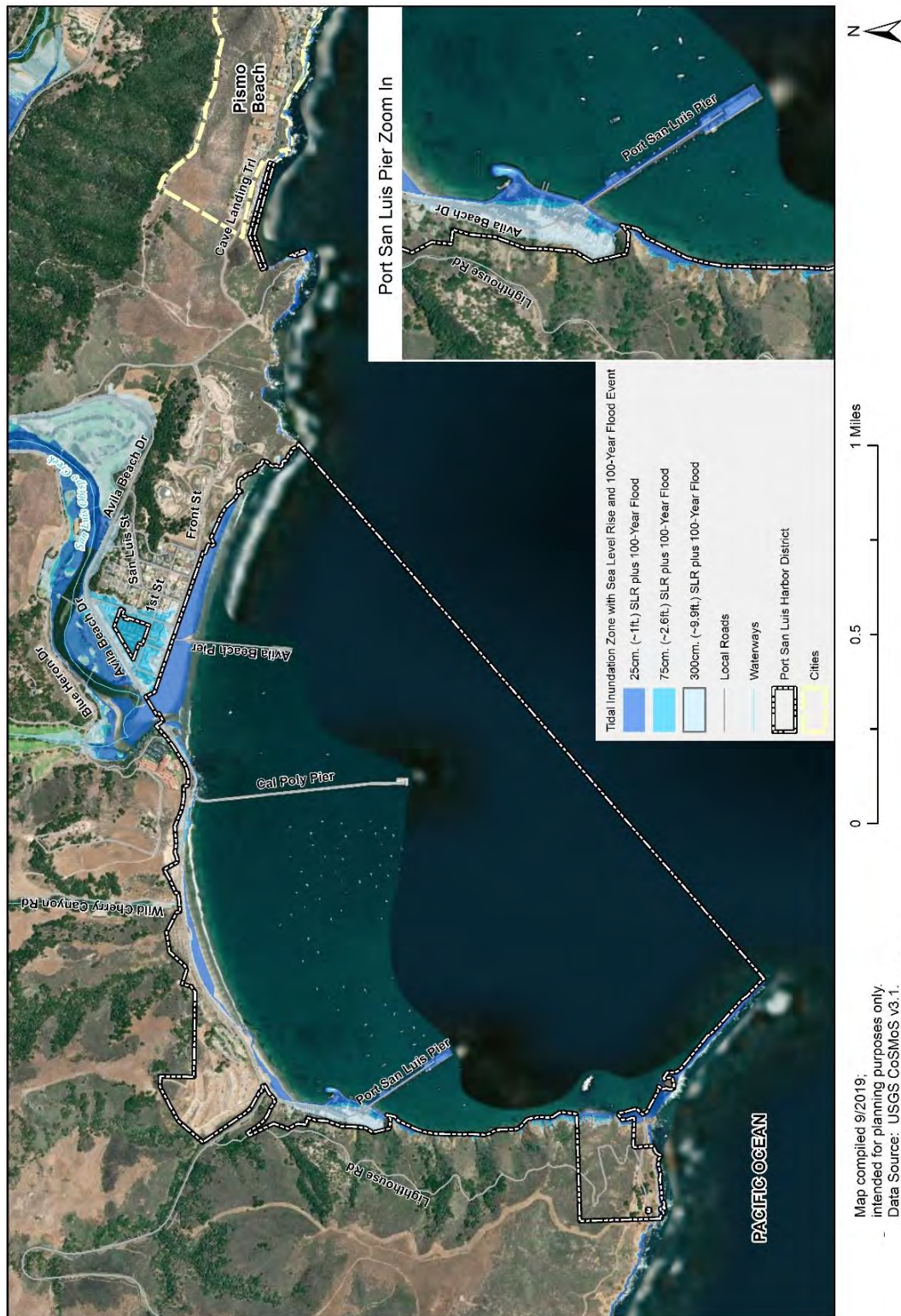


Figure R.4 Port San Luis Sea Level Rise Scenario Analysis: Tidal Inundation and 1% Annual Chance Flood



Earthquake and Liquefaction

There are two fault lines that run through the northern and northeastern portions of the District, part of the South Margin section of the San Luis Range system. As a coastal community, there is also a risk of earthquakes offshore and resulting tsunami events (refer to the Tsunami and Seiche section of this annex, below). In 1916 a magnitude 5.1 earthquake occurred offshore of Avila Beach in the San Luis Bay. There is limited data on these events at the local level including if ground shaking was felt and at what intensity. The earthquake reportedly resulted in smokestacks at the Union Oil Refinery at Port San Luis to fall, and a post-earthquake landslide to occur that blocked railroad tracks.

The Diablo Canyon Power Plant is located just north of the District and is within the proximity of the Hosgri fault line just offshore. The Power Plant was originally designed to withstand a 6.75 magnitude earthquake and has been upgraded to withstand a 7.5 magnitude earthquake. The Plant has in place extensive seismic monitoring and safety systems to shut down quickly in a significant ground shaking event. Refer to the Human Caused: Hazardous Materials section below for more information related to the Diablo Canyon Power Plant.

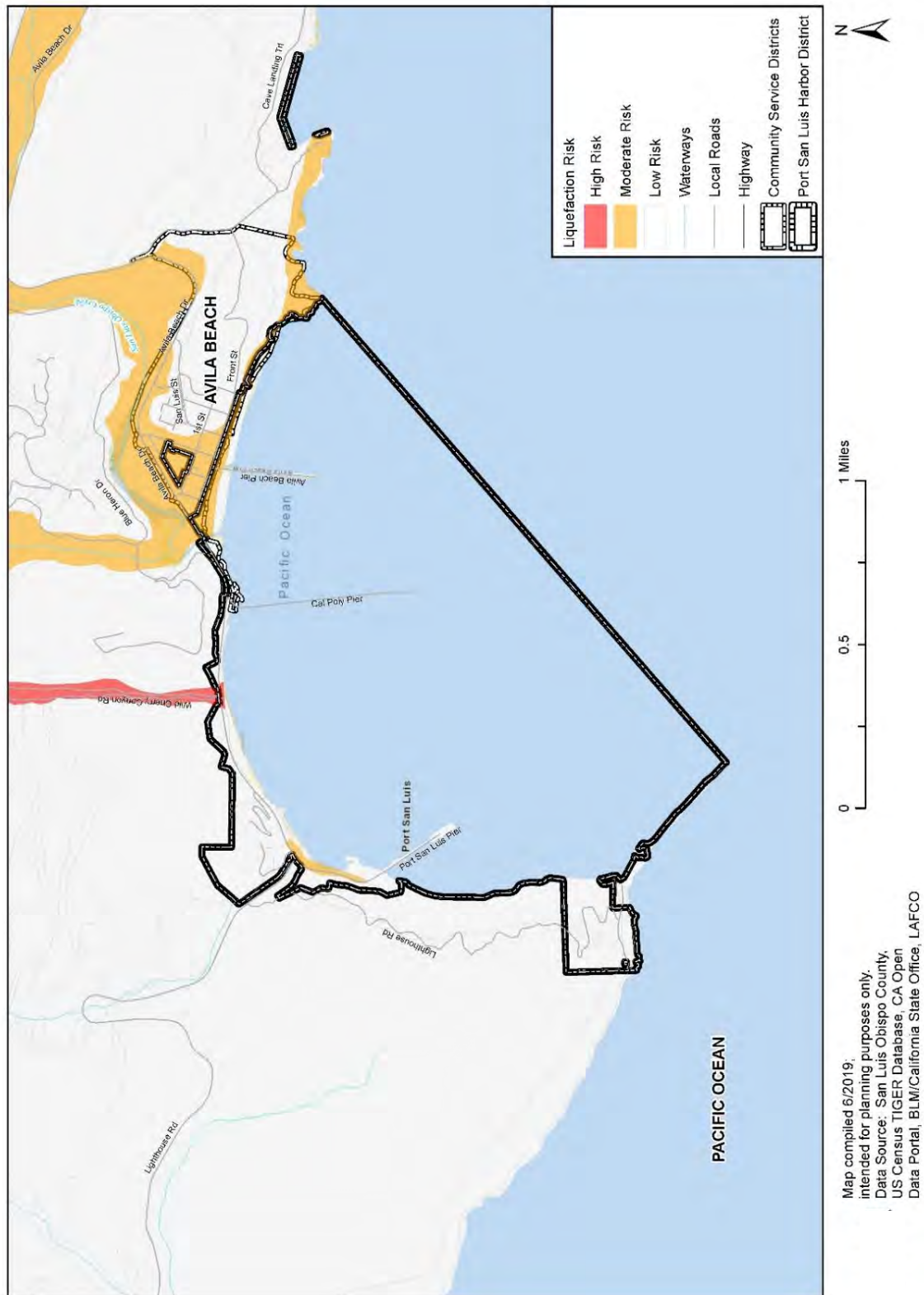
Liquefaction, the result of ground shaking causing fine grained, saturated soils to liquefy and act as a fluid, poses a risk to the District as well. Figure R.5 depicts the areas of the District at risk of high, moderate, or low liquefaction, while Table R.8 summarizes the parcels found to overlap with liquefiable soils in the District. Overall, earthquake and liquefaction hazards have been rated by the planning team to hold **Medium Significance**.

Table R.8 Port of San Luis Properties at Moderate Risk to Liquefaction

Parcel Type	Parcel Count	Improved Value	Content Value	Total Value
Government/Utilities	9	--	--	\$0
Total	9	\$0	\$0	\$0

Source: San Luis Obispo County Planning and Building Dept., Assessor's Office, ParcelQuest, Wood Plc Parcel Analysis

Figure R.5 Port of San Luis Harbor District Liquefaction Risk



Flood

The District is at risk of both coastal and riverine flooding. Coastal flooding was addressed in more detail the previous section of this annex on Coastal Storm/Coastal Erosion/Coastal Flooding and Inundation/Sea Level Rise. The San Luis Obispo Creek is 18 miles long and ends on the northern portion of the District right on the edge with Avila Beach, draining into the Pacific Ocean. The flooding within the Creek caused significant flood damage in 1969 and 1973. Due This stream poses the greatest risk of riverine flooding in the area, though smaller tributaries and unnamed creeks also cross the boundaries of the District to the north and northwest (along Wild Cherry Canyon Rd and Lighthouse Rd). The areas adjacent to the Creek have the Combining Designation of a Flood Hazard (FH) and must meet the County standards set forth in Title 23 and the San Luis Bay Coastal Area Plan (Area Plan). According to the Area Plan in the event of a 100-year flood event major flooding will occur throughout the length of the San Luis Obispo Creek. to the risk of flooding along the Creek, the Area Plan recommends designating open space land uses adjacent to the floodplain. Road infrastructure is most at risk of being damaged during a flood event in the planning area. The Avila Community Plan lists the following transportation infrastructure where flooding occurs often, some of which cross the boundaries of the Port San Luis Harbor District:

- Avila Beach Drive
- San Luis Bay Drive
- Ontario Road
- Parking Lot in Avila Beach

All the infrastructure listed above suffers from occasional flooding, but the parking lot is reported to flood consistently during the rainy season (January-March). In 2016, the San Luis Obispo County Public Works Department spent \$60,000 pumping water out of the parking lot. The Department created a Conceptual Design Report in 2017 that evaluated three alternatives to address the flooding issue. The final recommendation from the report was for the installation of a permanent pumping system (estimated cost of \$375,000) with projected operations and maintenance cost of approximately \$25,000 annually. The 2017-2018 County Capital Improvement Program (CIP) report identified a long-term flood control project (beyond the 5-year CIP timeframe) that will include a pumping system for the parking lot culvert outfall to mitigate the flooding issue. Overall, flooding hazards have been ranked by the planning team as holding **Medium Significance** for the District.

Values at Risk

A flood vulnerability assessment was completed during the County's HMP update, following the methodology described in Sections 5.2 and 5.3.11 of the Base Plan. Flood Hazards for the Port San Luis Harbor District planning areas are shown in Figure R.6, while Table R.9 summarizes the parcels and values at risk in the City's 100-year and 500-year floodplains. These tables also detail loss estimates for each flood, though in the case of the District there are no monetary losses that could be computed due to the properties at risk having no noted financial value (as they are exempt in nature).

Table R.9 Port San Luis Harbor District's FEMA Flood Hazard by Parcel Type

Parcel Type	Parcel Count	Improved Value	Content Value	Total Value	Loss Estimate
100-YEAR EVENT					
Government/Utilities	3	--	--	\$0	\$0
Total	3	\$0	\$0	\$0	\$0
500-YEAR EVENT					
Government/Utilities	2	--	--	\$0	\$0
Total	2	\$0	\$0	\$0	\$0
GRAND TOTAL	5	\$0	\$0	\$0	\$0

Source: San Luis Obispo County Planning and Building Dept., Assessor's Office, ParcelQuest, FEMA NFHL, Wood Plc Parcel Analysis

Based on this analysis, the District has five total parcels at risk of flooding of riverine inundation. These are all classified as government or utilities properties.

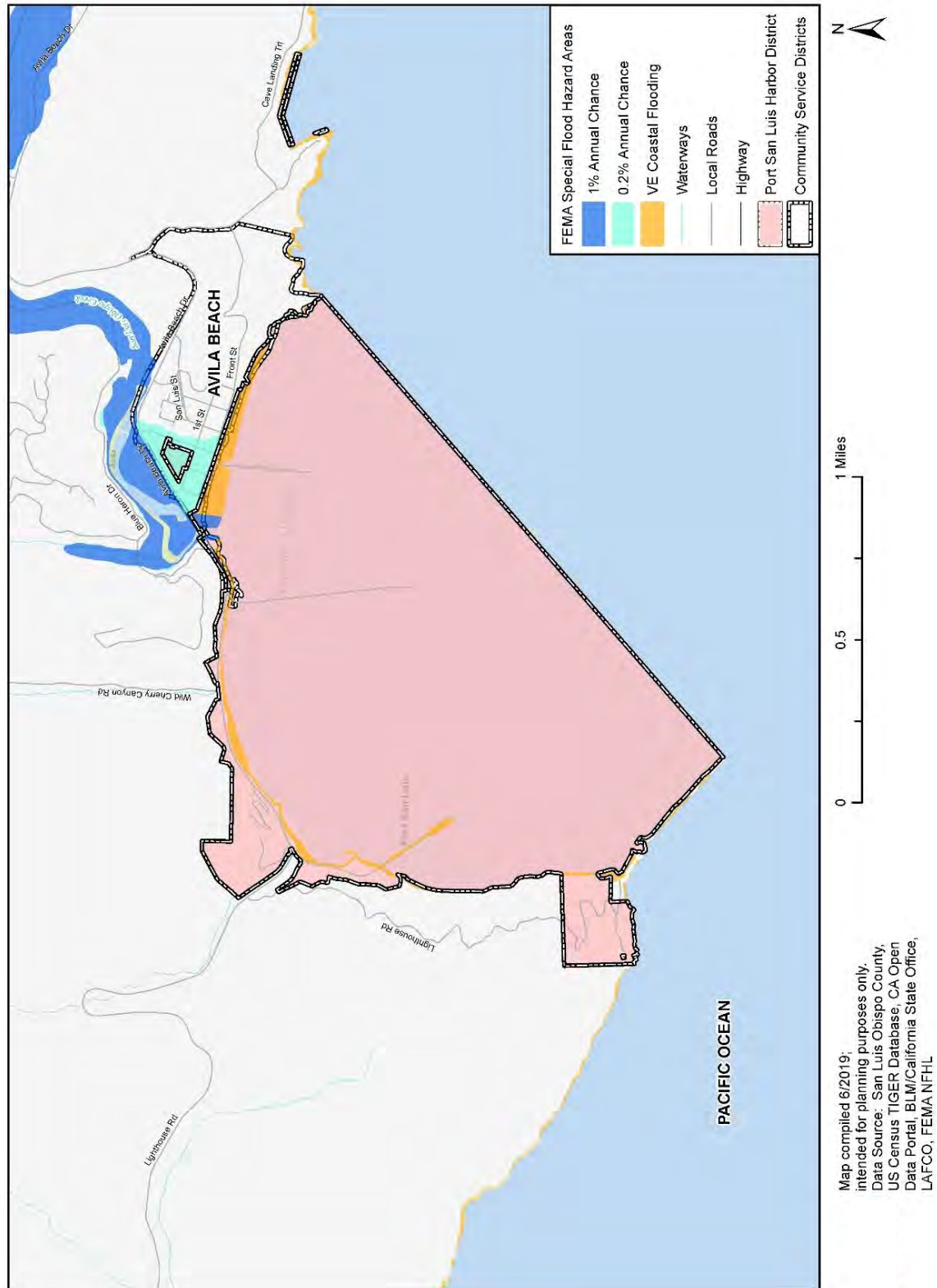
Limitations: This analysis may include structures in the floodplains that are elevated at or above the level of the base-flood elevation, which will likely mitigate flood damage.

The Harbor District is not required to participate separately in the National Flood Insurance Program (NFIP) but will continue to support the County's participation in and compliance with the NFIP.

Critical Facilities at Risk

Based on GIS analysis there are no critical facilities located in the 100-year or 500-year flood zones. (There are no critical facilities in the entire District, per the dataset used and described in more detail under subsection 5.2 of the Base Plan.)

Figure R.6 Port San Luis Harbor District Flood Hazard Areas



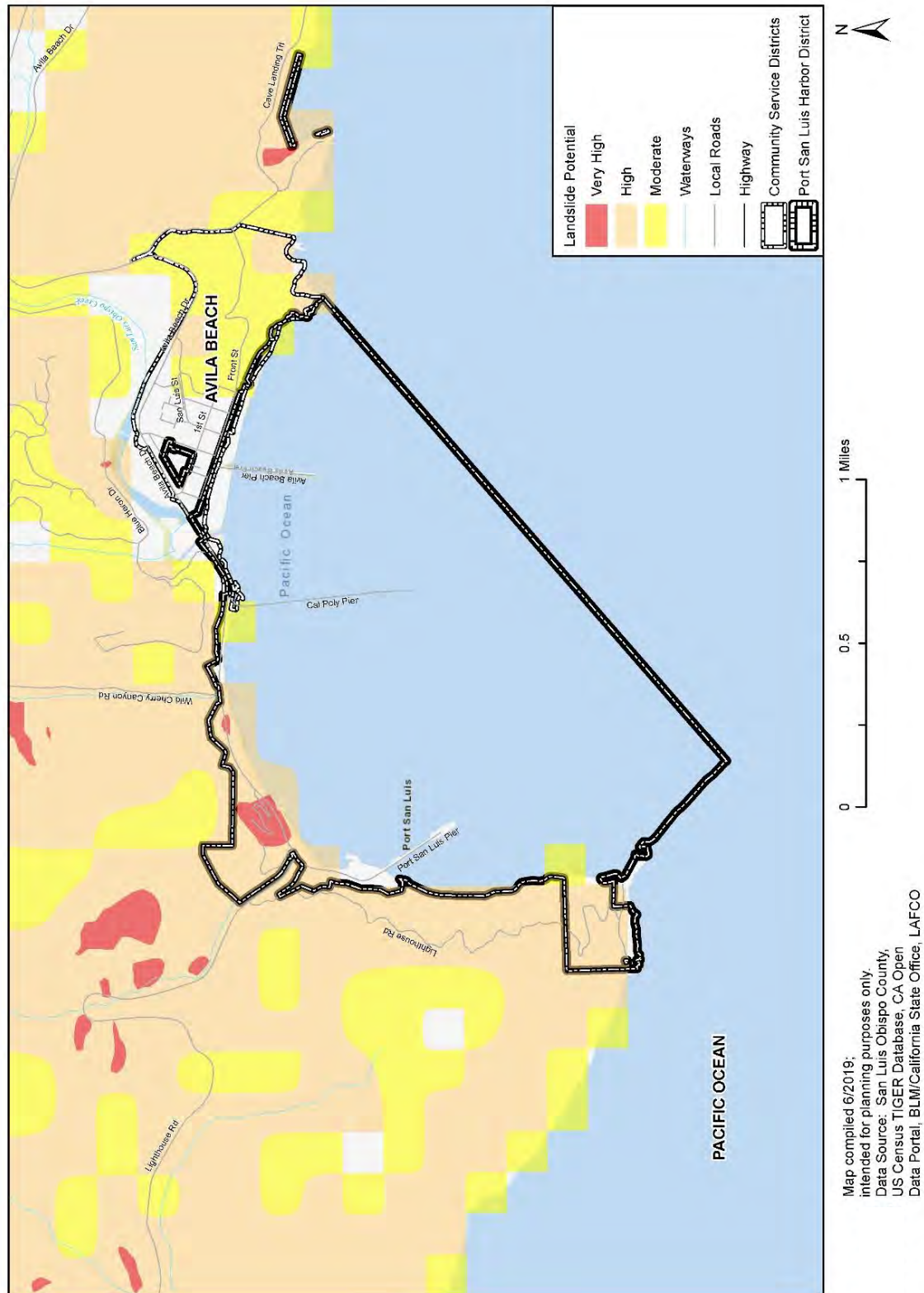
Landslides and Debris Flow

Most of the District is found within high potential landslide areas. As shown in Figure R.7 below, most of the western and northern portions of the District have been rated as having moderate, high, or very high potential to landslide hazards. A landslide event along Avila Beach Drive, the only major road into or out of the Town of Avila Beach, could have serious impacts on both visitors and residents as well as restrict travel to and from the Port of San Luis and the Diablo Canyon Power Plant. According to the local planning team, a massive landslide event that occurred 10 years ago along on Avila Beach Drive did cutoff access to the Port and Diablo Canyon. The committee noted there is an alternative entrance through Diablo Canyon, but it not designed for hundreds of vehicles over the extended period of time that would be necessary to clean debris from the roadway caused by a landslide or debris flow event.

While no critical facilities are found to overlap with landslide potential areas (as there are no critical facilities in the District based on the dataset used), the Port San Luis Lighthouse is considered a historical point of interest in the District, and this one is found within a high landslide potential area. In addition, the parcel analysis conducted in GIS yielded that one parcel classified as “government/utilities” was found within high landslide potential areas in the District. No monetary values are assigned to this government parcel as it is exempt in nature.

Overall, landslide and debris flow hazards have been ranked by the local planning team as holding **Medium Significance**.

Figure R.7 Landslide Potential Areas in the Port San Luis Harbor District



Tsunami

Tsunami inundation poses a risk to all coastal communities in the County of San Luis Obispo. Offshore faults and related seismic activity could cause a tsunami event off the coast of the District, even if the faults are hundreds of miles away. According to the County's Tsunami Response Plan the areas within and nearby the Avila Beach community and the Port San Luis Harbor District that are most vulnerable to a tsunami event include areas inland within and adjacent to San Luis Obispo Creek, including Avila Beach Drive. There have been three recorded tsunami events between 1946 and 1964 that have impacted the Avila Beach community and possibly the Port District. Refer to subsection 5.3.14 of the Base Plan for more information related to the past tsunami and seiche events and details on future vulnerability and climate change issues.

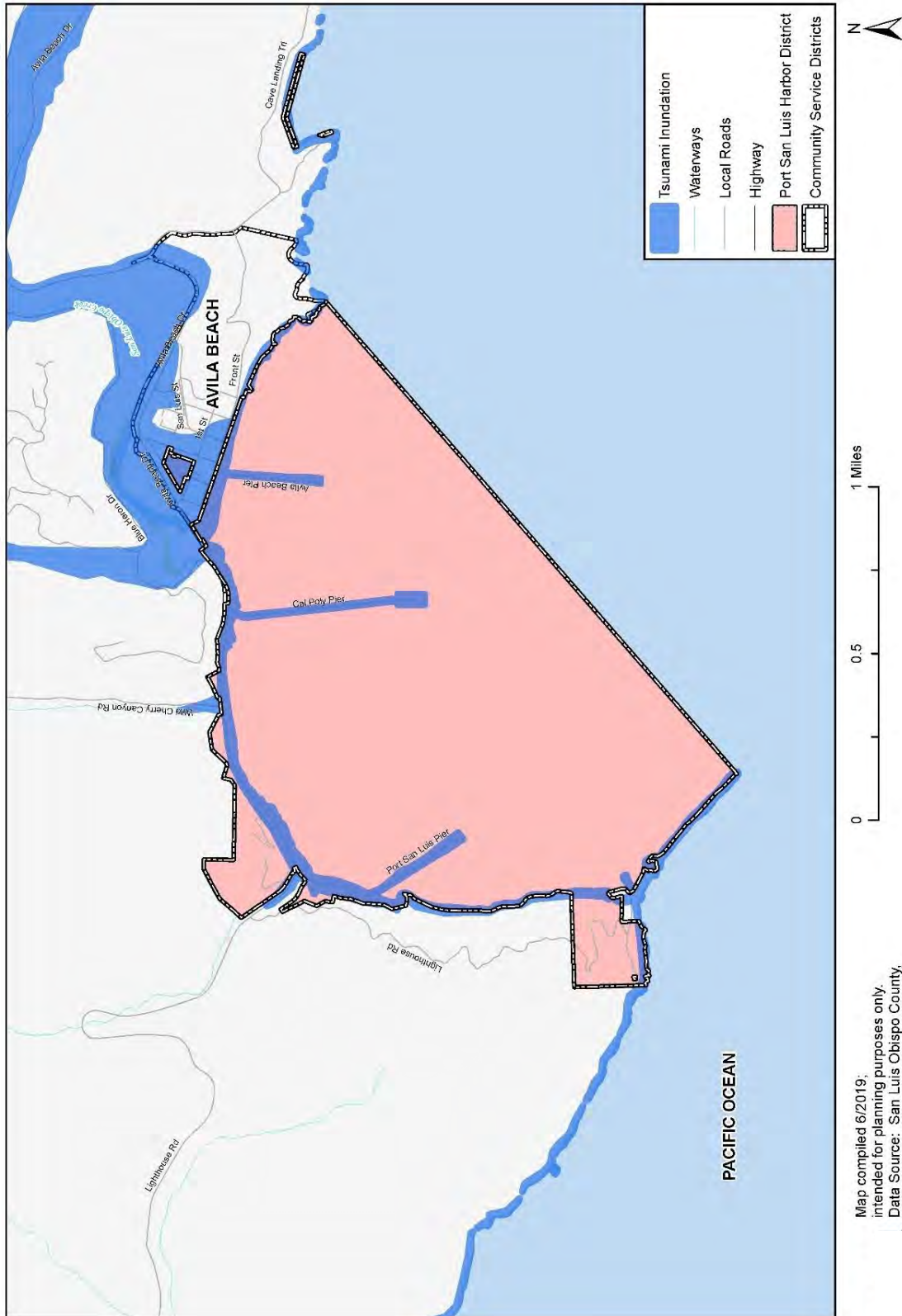
Figure R.8 below displays the tsunami inundation areas affecting the District and nearby community of Avila Beach, while Table R.10 summarizes the 10 ten/utilities/exempt parcels found in these inundation extents, based on GIS parcel analysis. Overall, the local planning team rated tsunami and seiche hazards as holding **Medium Significance** for the District.

Table R.10 Parcels in Tsunami Inundation Areas, by Parcel Type, Port San Luis Harbor District

Parcel Type	Parcel Count	Improved Value	Content Value	Total Value	Loss Estimate
Government/Utilities	9	--	--	--	--
Other/Exempt/Miscellaneous	1	--	--	--	--
Total	10	\$0	\$0	\$0	\$0

Source: San Luis Obispo County Planning and Building Dept., Assessor's Office, ParcelQuest, CA Dept. of Conservation, Wood Plc Parcel Analysis

Figure R.8 Tsunami Inundation Areas in the Port San Luis Harbor District



Wildfire

Wildfire is a **Medium Significance** hazard for the Port San Luis Harbor District.

There is no fire history in the community but due to factors such as the Irish Hills, a notable topographic feature north of Avila Beach, CalFire has designated the Avila Beach community as being at an increased risk from wildfires and a priority community to work with to prepare and mitigate potential fire risk. Because of the Port District's slight boundary overlap with Avila Beach as well as proximity to said Community Services District, these community designations are important for the Port District to observe and keep in mind. The prevailing wind patterns are another dominant factor that influences the wildfire risk in the Avila Beach and Port District areas, as the planning team noted that there are lots of fuel sources in the canyon to Avila Beach. A fire that originates in the Los Osos area or at the Diablo Canyon Power Plant could be pushed by prevailing winds southeast towards the District and nearby communities (San Luis Obispo County Community Wildfire Protection Plan 2019).

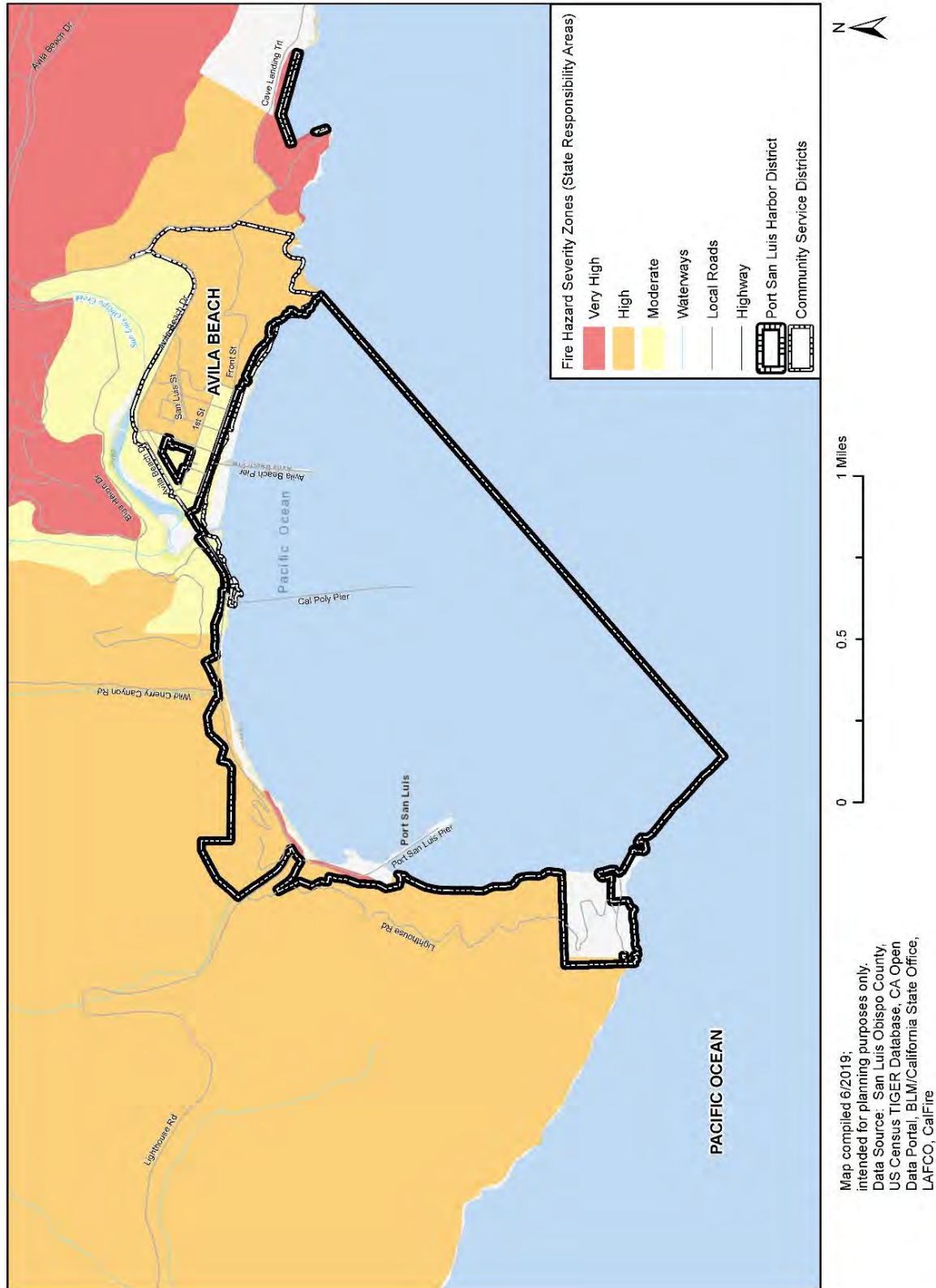
Figure R.9 below depicts the wildfire hazard zones within State Responsibility Areas in and near the District. Based on parcel analysis performed in GIS, it was found that a total of 11 properties overlap with either moderate or very high fire hazard severity zones, per the CalFire spatial dataset (see Table R.11 for the parcel analysis summary with regards to this hazard).

Table R.11 Parcels in Wildfire Hazard Severity Zones in the Port San Luis Harbor District

Parcel Type	Parcel Count	Improved Value	Content Value	Total Value	Loss Estimate
MODERATE WILDFIRE HAZARD SEVERITY					
Government/Utilities	9	--	--	--	--
Other/Exempt/Miscellaneous	1	--	--	--	--
Total	10	\$0	\$0	\$0	\$0
VERY HIGH WILDFIRE HAZARD SEVERITY					
Government/Utilities	1	--	--	--	--
Total	1	\$0	\$0	\$0	\$0
GRAND TOTAL	11	\$0	\$0	\$0	\$0

Source: San Luis Obispo County Planning and Building Dept., Assessor's Office, ParcelQuest, CalFire, Wood Plc Parcel Analysis

Figure R.9 Wildfire Hazard Severity Zones in and Near the Port San Luis Harbor District



Human Caused: Hazardous Materials

While the Avila Beach community has a history of hazardous material incidents, the Cal OES Warning Center does not specifically report any hazardous materials incidents within the District boundaries from 1994 through October of 2018. Cal OES does report 209 incidents in unincorporated San Luis Obispo County, some of which may cross the District boundaries. Similarly, some of the 97 hazardous materials incidents reported in Avila Beach might fall within the District. However, a lack of data makes it difficult to know if any of those took place within the Port's jurisdiction. As noted in subsection 5.3.16, only around 6% of reported hazardous materials incidents result in injuries, fatalities, or evacuations.

The California State Water Resources Control Board has identified seven sites with hazardous materials that may contaminate groundwater supplies in the Avila Beach community, just east of the District. A total of six of the identified Avila Beach sites have been closed and one remains an open case, site of the former Unocal Tank Farm site which contained 22 storage units for over ninety years and were a dominating visual feature in Avila Beach. After an oil spill caused by Unocal (a subsidiary of Chevron) resulted in extensive cleanup of Avila Beach including removing and rebuilding the entire commercial district, the tanks were removed, and the Tank Farm site was used to support the cleanup efforts. Today, the area is the one industrial zone property in Avila Beach and is completely fenced off to the public. Chevron maintains the sewage disposal system and fire protection facilities for the site and receives water from the Avila Beach Community Services District.

The Diablo Canyon Nuclear Power Plant, the state's only operating nuclear power plant, is located northwest of the Port District. Accidental release of nuclear materials continues to be a concern for the port community, although extensive seismic monitoring and safety systems are in place and the Power Plant has been retrofitted to withstand a 7.5 magnitude earthquake. Avila Beach Drive is currently the only access to the Diablo Canyon Power Plant which has also caused concern within the community if an evacuation were to happen. The Diablo Canyon Nuclear Power Plant is scheduled to be closed by the year 2025. Even with the coming closure the County of San Luis Obispo Office of Emergency Services has done extensive planning in case of an emergency at the Power Plant. Refer to subsection 5.3.16 HazMat for more information on these hazards. Overall, the planning team has rated HazMat issues as holding **High Significance** to the District.

R.4 Capability Assessment

Capabilities are the programs and policies currently in use to reduce hazard impacts or that could be used to implement hazard mitigation activities. This capabilities assessment is divided into five sections: regulatory mitigation capabilities, administrative and technical mitigation capabilities, fiscal mitigation capabilities, mitigation outreach and partnerships, and other mitigation efforts.

To develop this capability assessment, the jurisdictional planning representatives used a matrix of common mitigation activities to inventory policies or programs in place. The team then supplemented this inventory by reviewing additional existing policies, regulations, plans, and programs to determine if they contributed to reducing hazard-related losses.

During the plan update process, this inventory was reviewed by the jurisdictional planning representatives and Wood consultant team staff to update information where applicable and note ways in which these capabilities have improved or expanded. In summarizing current capabilities and identifying gaps, the jurisdictional planning representatives also considered their ability to expand or improve upon existing policies and programs as potential new mitigation strategies. The Port San Luis Harbor District's capabilities are summarized below.

R.4.1 Regulatory Mitigation Capabilities

Table R.12 identifies existing regulatory capabilities the District has in place to help with future mitigation efforts. Note that many of the regulatory capabilities which can be used for the District are within the County's jurisdiction. Refer to Section 6 Capability Assessment of the Base Plan for specific information related to the County's overall mitigation capabilities.

Table R.12 Port San Luis Harbor District Regulatory Mitigation Capabilities

Regulatory Tool	Yes/No	Comments
General plan	N/A	
Zoning ordinance	N/A	
Subdivision ordinance	N/A	
Growth management ordinance	N/A	
Floodplain ordinance	N/A	
Other special purpose ordinance (stormwater, water conservation, wildfire)	N/A	
Building code	N/A	
Fire department ISO rating	N/A	
Erosion or sediment control program	N/A	
Stormwater management program	Yes	SWPPP updated in 2015
Site plan review requirements	N/A	
Capital improvements plan	Yes	
Economic development plan	No	
Local emergency operations plan	Yes	
Other special plans	Yes	Sewer spill and oil spill plans. Diablo NPP prep.
Flood Insurance Study or other engineering study for streams	No	
Elevation certificates (for floodplain development)	No	

Source: Wood Data Collection Guide, 2019

R.4.2 Administrative/Technical Mitigation Capabilities

Table R.13 identifies the personnel responsible for activities related to mitigation and loss prevention in the Port San Luis Harbor District.

Table R.13 Port San Luis Harbor District Administrative/Technical Mitigation Capabilities

Personnel Resources	Yes/No	Department/Position
Planner/engineer with knowledge of land development/land management practices	Yes	Facilities Dept. – Fac. Mgr. & Planner/Analyst
Engineer/professional trained in construction practices related to buildings and/or infrastructure	Yes	Facilities Dept. – Fac. Mgr. & Fac. Supervisor
Planner/engineer/scientist with an understanding of natural hazards	Yes	Facilities Dept. – Fac. Mgr. & Planner/Analyst
Personnel skilled in GIS	Yes	Facilities Dept. – Fac. Mgr. & Planner/Analyst
Full time building official	Yes	Facilities Dept. – Fac. Mgr. & Fac. Supervisor
Floodplain manager	No	Not required
Emergency manager	Yes	Harbor Patrol & Facilities Dept. Planner/Analyst
Grant writer	Yes	Harbor Manager & Facilities Dept.

Personnel Resources	Yes/No	Department/Position
Other personnel	Yes	Harbor Patrol & Business Manager
GIS Data Resources (Hazard areas, critical facilities, land use, building footprints, etc.)	Yes	Facilities Dept. – Fac. Mgr. & Planner/Analyst
Warning systems/services (Reverse 9-11, outdoor warning signals)	Yes	Harbor Patrol – Reverse 911 and CMS Board

Source: Wood Data Collection Guide, 2019

R.4.3 Fiscal Mitigation Capabilities

Table R.14 identifies financial tools or resources that the CSD could potentially use to help fund mitigation activities.

Table R.14 Port San Luis Harbor District Fiscal Mitigation Capabilities

Financial Resources	Accessible/Eligible to Use (Yes/No)
Community Development Block Grants	No
Capital improvements project funding	Yes
Authority to levy taxes for specific purposes	Yes
Fees for water, sewer, gas, or electric services	Yes
Impact fees for new development	No
Incur debt through general obligation bonds	Yes
Incur debt through special tax bonds	Yes
Incur debt through private activities	Yes
Withhold spending in hazard prone areas	No

R.4.4 Mitigation Outreach and Partnerships

The District has a Harbor Commission composed of five elected Commissioners. The Avila Beach Community Service District, which serves the neighboring town, shares many core values and goals as the Harbor District. Together the two Districts run a responsible resource use outreach programs to encourage conservation and efficiency of water use, for example, by sending out public notices encouraging conversation and responsible use. The Districts also jointly share the operation and maintenance costs of the Wastewater Treatment Plant.

R.4.5 Opportunities for Enhancement

Based on the capability assessment, the Port San Luis Harbor District has several existing mechanisms in place that help to mitigate hazards. There are also opportunities for the District to expand or improve on these policies and programs to further protect the community. Future improvements may include providing training for staff members related to hazards or hazard mitigation grant funding in partnership with the County and Cal OES. Additional training opportunities will help to inform District staff and board members on how best to integrate hazard information and mitigation projects into the District policies and ongoing duties of the District. Continuing to train District staff on mitigation and the hazards that pose a risk to the Port San Luis Harbor District will lead to more informed staff members who can better communicate this information to the public.

R.5 Mitigation Strategy

R.5.1 Mitigation Goals and Objectives

The Port San Luis Harbor District adopts the hazard mitigation goals and objectives developed by the County HMPC and described in Section 7 Mitigation Strategy.

R.5.2 Mitigation Actions

The planning team for the Port San Luis Harbor District identified and prioritized the following mitigation actions based on the risk assessment. Actions were prioritized using the process described in subsection 7.2.1 of the Base Plan. Background information and information on how each action will be implemented and administered, such as ideas for implementation, responsible office, potential funding, estimated cost, and timeline are also included. Refer to Table R.15 below of the Port San Luis Harbor District's 2020 Mitigation Action Plan.

Table R.15 Port San Luis Harbor District's Mitigation Action Plan

ID	Hazard(s) Mitigated	Description/Background/ Benefits	Lead Agency and Partners	Cost Estimate	Potential Funding	Priority	Timeline	Status/ Implementation Notes
PS.1	Coastal Storm/Coastal Erosion/Sea Level Rise; Tsunami; Earthquake	Future Avila Pier Replacement. Develop replacement plan; remove wooden pier; replace pier with structure able to withstand sea level rise and heavy storms and waves, ideally with stronger materials like concrete and steel.	Port San Luis Harbor District	Over \$1,000,000	Coastal Conservancy; DBW; WCB; CA Parks and Rec	Low	More than 5 yrs.	New Benefits: Ensures continued existence of Avila Pier which serves the public and is a tourist attraction
PS.2	Coastal Storm/Coastal Erosion/Sea Level Rise; Tsunami	Revetment and Jetty Augmentation. Survey existing jetty; develop repair and augmentation plan; repair or replace revetment and jetty. Possibly replace with seawall or install seawall on top of existing jetty.	Port San Luis Harbor District	\$500,000 to \$1,000,000	Division of Boating and Waterways; SLOCOG; PSLHD	High	2-5 yrs.	New Benefits: Would allow the continuation of port operations and businesses during storms and sea level rise. Would allow full use of launching facilities and parking which is vital to commercial and recreational fishing. It would help ensure the preservation of buildings and facilities It could possibly decrease the amount of

ID	Hazard(s) Mitigated	Description/Background/ Benefits	Lead Agency and Partners	Cost Estimate	Potential Funding	Priority	Timeline	Status/ Implementation Notes
								dredging which would benefit the environment.
PS.3	Coastal Storm/Coastal Erosion/Sea Level Rise; Flood; Landslide and debris flow; Earthquake	Avila Beach Revetment Repairs to ensure Avila Beach Drive doesn't fail due to erosion and undermining.	County of SLO; Port San Luis Harbor District; Avila Beach CSD	Over \$1,000,000	County of SLO; SLOCOG; PSLHD;	Medium	More than 5 yrs.	New Survey existing jetty; develop repair and augmentation plan; repair revetment. Benefits: Ensures The road is essential for access to Diablo Canyon NPP and Port San Luis.
PS.4	Coastal Storm/Coastal Erosion/Sea Level Rise; Flood	Avila Beach Drainage Station. Come up with a solution for drainage in Avila Beach which accumulates along Beach Colony Lane and the Avila Parking Lot; install pump station or diversion for flood waters; identify funding for long-term operations and maintenance.	County of SLO; Port San Luis Harbor District; Avila Beach CSD; Avila Beach property owners	\$500,000 to \$1,000,000	SLO County; property owners; FEMA HMA	Medium	More than 5 yrs.	New Benefits: Flood prevention in low-lying areas in Avila Beach; reduction of health hazards caused by flooding
PS.5	Coastal Storm/Coastal Erosion/Sea Level Rise; Tsunami	Avila Pier Rehabilitation. Develop replacement plan; repair damaged piles and above water pier structure; open full pier to public.	Port San Luis Harbor District	Over \$1,000,000	Coastal Conservancy; DBW; WCB; CA Parks and Rec	Medium	2-3 yrs.	New Benefits: Allow re-opening and full access to Avila Pier; currently the pier is in disrepair and is in danger

ID	Hazard(s) Mitigated	Description/Background/ Benefits	Lead Agency and Partners	Cost Estimate	Potential Funding	Priority	Timeline	Status/ Implementation Notes
								of further damage during storms if repairs are not made
PS.6	Earthquake	Harbor Patrol and staff to review Harbor District's Emergency Action Plan and procedures periodically and maintain a hardcopy on-site	Port San Luis Harbor District	Minimal	NA	Medium	Annually	New
PS.7	Earthquake	Reinforce and maintain revetment below and hillside above Avila Beach Drive to prevent road failures and closures due to earthquake caused landslides	County of SLO, Port San Luis Harbor District	Unknown	Unknown	Medium	2-5 yrs.	New
PS.8	Wildfires	Continue weed abatement and maintaining defensible space on Harbor District properties	Port San Luis Harbor District	Unknown	Unknown	Medium	Annually	New
PS.9	Tsunami	Harbor Patrol and staff to review County's Tsunami Response Plan and procedures periodically and maintain a hardcopy on-site	Port San Luis Harbor District	Minimal	NA	High	1-2 yrs.	New
PS. 10	Adverse Weather: High Winds, Hail	Use GIS to develop vulnerability assessment model of structures at risk of damage from high winds; replace roofing systems nearing end of expected lifespan with PVC roofing systems to minimize damage and prevent uplift. Reinforce and upkeep Harford Pier Canopy to prevent wind related damage and failure.	Port San Luis Harbor District	\$80-100k	District funds	Medium	TBD	New/Ongoing Roof replacements with heat-welded PVC flat roofs for two structures on end of Harford Pier. Inspect and reinforce Harford Pier Canopy to maintain wind resilience

ID	Hazard(s) Mitigated	Description/Background/ Benefits	Lead Agency and Partners	Cost Estimate	Potential Funding	Priority	Timeline	Status/ Implementation Notes
PS. 11	Adverse Weather: Dense Fog	Maintain maritime visual navigation aids: 6 USCG lighted channel markers and Point San Luis Lighthouse; provide boaters, fishermen, and staff with weather forecasts. Use storm lights on Harford Pier during extreme fog.	Port San Luis Harbor District	\$50-75k	District funds	Low	1-2 years	Keep channel markers maintained and replace as needed. Maintain and upgrade storm lights on Harford Pier. Seek replacement with low setting for fog.
PS. 12	Adverse Weather: Lightning	Maintain and periodically review Emergency Action Plan and Fire Plans. Maintain lightning rods on Harford Pier.	Port San Luis Harbor District	Minimal	District funds	Low	Annually	Maintain lightning rods on Harford Pier
PS. 13	Adverse Weather: Extreme Heat	Provide seasonal training to staff on the Heat Illness Prevention Plan (HIPP) and update plan as needed	Port San Luis Harbor District	Minimal	District funds	Low	Annually	New. In process of preparing updated draft of District's HIPP
PS. 14	High Winds	Assess the historic canopy at the end of the Harford Pier for reinforcement and repair options.	Port San Luis Harbor District	TBD	District funds	Low	2-5 years	The canopy was repaired in 2011, and is again in need of reinforcement and/or repair.

R.6 Implementation and Maintenance

Moving forward, the Port San Luis Harbor District will use the mitigation action table in the previous section to track progress on implementation of each project. Implementation of the plan overall is discussed in Section 8 in the Base Plan.

R.6.1 Incorporation into Existing Planning Mechanisms

The information contained within the Base Plan and this Annex, including results from the Vulnerability Assessment and the Mitigation Strategies, will be used by the Port San Luis Harbor District to help inform updates of the District's relevant plans and planning documents, and in the development of additional local plans, programs, and policies. Understanding the hazards that pose a risk and the specific vulnerabilities to the community will help in future capital improvement planning for the District. The San Luis Obispo County Planning and Building Department may utilize the hazard information when reviewing a site plan or other type of development applications with the boundaries of the Port San Luis Harbor District and surrounding areas. As noted in Section 8 Implementation and Monitoring, the County's HMPC representative/s from the Port San Luis Harbor District will report on efforts to integrate the hazard mitigation plan into local plans, programs and policies and will report on these efforts at the annual HMPC and local planning team review meetings.

R.6.2 Monitoring, Evaluation and Updating the Plan

The Port San Luis Harbor District will follow the procedures to monitor, review, and update this plan in accordance with San Luis Obispo County as outlined in Section 3 Planning Process and Section 8 Implementation and Monitoring of the Base Plan. The District will continue to involve the public in mitigation, as described in subsection 8.3 of the base plan. The Port San Luis Harbor District Facilities Manager will be responsible for representing the District in the County HMPC, and for coordination with County staff and departments during plan updates. The Port San Luis Harbor District realizes it is important to review the plan regularly and update it every five years in accordance with the Disaster Mitigation Act Requirements as well as other State of California requirements.

R.7 Attachment: Property Inventory for Program Year 2019-2020

Special District Risk Management Authority

Property Inventory for Program Year 2019-20



Port San Luis Harbor District

Item	Description	Address	Square Feet	Building Value	Contents Value	Under Construction	BIRI	BIRI Coverage	Net Premium	Effective Date	Termination Date
1	Accounting Office	Harbor Terrace	1,568	\$20,924	\$10,382				\$52		
8	Avila Bait Shop	Avila Pier - Front Street	496	\$49,904	\$0				\$83		
12	Avila Pier	Avila Pier	47,700	\$8,491,063	\$0				\$14,087		
18	Canopy over Restaurant	Harford Pier	14,280	\$784,650	\$10,382				\$1,319		
20	Coastal Gateway Building	3900 Avila Beach Drive	2,470	\$1,569,300	\$103,820				\$2,776		
22	Diesel Facility/Pump Out	Harford Pier	100	\$72,083	\$0				\$120		
33	East Duplex - Caretakers	Lighthouse Properties	1,550	\$392,325	\$0				\$651		
39	Fat Cat's Restaurant	3290 Avila Beach Drive	1,600	\$502,176	\$0				\$833		
48	Floating Docks (3) @\$18,500 ea.	Harford Pier	0	\$70,010	\$0				\$116		
53	Fuel Facility/HazMat	Avila Beach Drive	200	\$26,042	\$5,191				\$52		
60	Harbor Office/Restrooms	3950 Avila Beach Drive	2,200	\$590,273	\$122,282				\$1,182		
64	Harbor Patrol Office/Cold Storage	3991 Avila Beach Drive - Harford Pi	3,520	\$505,603	\$83,056				\$977		
68	Harford Pier	Harford Pier	87,500	\$18,198,905	\$0				\$30,194		
70	Historic Lighthouse- West Duplex	Lighthouse Properties	1,845	\$549,255	\$0				\$911		
74	Horn House	Lighthouse Properties	1,900	\$496,945	\$13,185				\$846		
78	Ice House	Harford Pier	1,800	\$376,632	\$0				\$625		
84	Lifeguard Bldg. & Restrooms	Avila Pier - Front Street	2,000	\$324,322	\$31,027				\$590		
87	Lifeguard Towers	Avila Pier - Front Street	100	\$83,643	\$0				\$139		
98	Lighthouse	Lighthouse Properties	2,190	\$1,569,300	\$103,820				\$2,776		
99	Lighthouse Barn/ Maint. Bldg.	Marlin Stebbins Road	200	\$52,310	\$0				\$87		
104	Lighthouse Service Bldg	Marlin Stebbins Road	900	\$235,395	\$0				\$391		
109	Maintenance Building	Avila Beach Drive	1,800	\$376,632	\$259,550				\$1,055		
110	Mersea Restaurant	3985 Avila Beach Dr.	1,800	\$523,100	\$0				\$868		
111	Mobile Hoist Pier	Harford Landing Area	60	\$523,100	\$0				\$868		
112	Mooring Storage Shed	3950 Avila Beach Drive	900	\$52,310	\$51,910				\$173		
119	Olde Port Inn Restaurant	3993 Avila Beach Drive - Harford Pi	8,372	\$1,789,982	\$0				\$2,970		
124	OPB Restrooms	Avila Beach Drive	400	\$141,237	\$0				\$234		
128	Outbuilding	Lighthouse Properties	100	\$16,691	\$0				\$28		
133	Patriot Sport Fishing Office	3975 Avila Beach Drive - Harford Pi	400	\$38,505	\$0				\$64		
137	Pavement/Lighting/Pipes (above ground)	Avila Beach Drive	0	\$235,956	\$0				\$391		
141	Pavement/Lighting/Pipes (above ground)	Harbor Terrace	0	\$53,601	\$0				\$89		
145	Pavement/Lighting/Pipes (above ground)	Harford Pier	0	\$80,557	\$0				\$134		
156	Pier Restroom	Avila Pier - Front Street	175	\$141,237	\$0				\$234		
165	Sewer Lift Station #1	Harford Pier	0	\$41,311	\$0				\$69		
167	Sewer Lift Station #2	Harford Parking Lot	150	\$104,620	\$25,955				\$217		
170	Sewer Lift Station #3	Avila Beach Drive	150	\$313,860	\$83,056				\$650		
175	Sewer Lift Station #4	Avila Pier - Front Street	150	\$68,259	\$15,573				\$139		
176	Sewer Lift Station #5	3915 Avila Beach Dr.	0	\$41,848	\$0				\$69		
190	Sport Launch Bldg.	3920 Avila Beach Drive	1,500	\$523,100	\$0				\$868		

This is a listing of your currently scheduled items with SDRMA

Special District Risk Management Authority
1112 I Street Suite 300, Sacramento, California 95814-2865
Tel 916.231.4141 or 800.537.7790 Fax 916.231.4111
www.sdrma.org

Report Date: 07/10/2019

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Special District Risk Management Authority

Property Inventory for Program Year 2019-20



Port San Luis Harbor District

Item	Description	Address	Square Feet	Building Value	Contents Value	Under Construction	BIRI	BIRI Coverage	Net Premium	Effective Date	Termination Date
196	Sport Launch Fuel Facility	3915 Avila Beach Drive	120	\$28,661	\$0				\$48		
205	Water Tank/Domestic Well	Lighthouse Properties	0	\$62,772	\$0				\$104		
211	Water Tower 100k. gal./Booster Pump	Harbor Terrace	0	\$215,690	\$0				\$358		
Totals				\$40,334,089	\$919,189						

This is a listing of your currently scheduled items with SDRMA

Special District Risk Management Authority
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Tel 916.231.4141 or 800.537.7790 Fax 916.231.4111
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Report Date: 07/10/2019

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S.1 District Profile

S.1.1 Mitigation Planning History and 2019 Process

The San Luis Obispo Flood Control and Water Conservation District (FCWCD or "District") participated in the 2014 San Luis Obispo County Hazard Mitigation Plan. This Annex was created during the development of the 2019 San Luis Obispo County Hazard Mitigation Plan Update to focus on the capabilities, hazards and mitigation actions specific to the District. The two Deputy Directors of County Public Works represented the District on the County HMPC and took the lead for developing the plan this annex in coordination with the FCWCD Local Planning Team (LPT). A review of jurisdictional priorities found no significant changes in priorities since the last update. The previous mitigation plan was not incorporated into other District planning mechanisms.

The LPT will be responsible for implementation and maintenance of the plan.

Table S.1 San Luis Obispo Flood Control & Water Conservation District Hazard Mitigation Planning Team

Department or Stakeholder	Title
County Public Works	Deputy Director – Resources Management Group
County Public Works	Deputy Director – Transportation & Development Group
County Public Works	Development Services Division Manager
County Public Works	Transportation Division Manager
County Public Works	Utilities Division Manager
County Public Works	Water Resources Division Manager

More details on the planning process followed and how the jurisdictions, service districts and stakeholders participated can be found in Section 3 of the Base Plan, as well as how the public was involved during the 2019 update.

The District boundaries are the same as the County of San Luis Obispo boundaries.

S.1.2 District Overview

The San Luis Obispo County Flood Control and Water Conservation District Act established the FCWCD in 1945. The main purpose of the FCWCD is to provide for the control, disposition and distribution of flood and storm waters of the district, to conserve such waters for beneficial and useful purposes by storing or recharge, and to increase and prevent the waste or diminution of the water supply in the district. The County of San Luis Obispo Board of Supervisors are designated as and empowered to act as the ex officio board of supervisors for the FCWCD. County officers and staff perform duties as officers and staff for the FCWCD.

In 1968, the FCWCD adopted Resolution No. 68-223 that defined the policy role of the FCWCD relating to the costs of planning, design, construction, operations and maintenance of drainage and flood control facilities. In general, the FCWCD cannot be responsible for direct funding of community specific mitigation improvements. The FCWCD uses its general funding to identify flooding problems, recommend solutions, and help local areas implement recommended solutions. In 2016, the FCWCD adopted Resolution 2016-281 that superseded the 1968 Policy to include among other things considerations for the changes in public financing laws such as Proposition 218.

The District has a regional role and can work with individual cities or communities to setup zones of benefit to implement solutions. The Public Works Department is additionally responsible for managing, planning, and



maintaining drainage and flood control facilities in the unincorporated public areas where no other agency has assumed an active role in such activities.

S.1.3 Development Trends

See subsection 4.10 of the Base Plan, as well as the Future Development sections of the Hazard Profiles in Section 3.

S.1.4 Other Community Planning Efforts

The following related planning efforts include information relevant to informing this annex and, in some cases, have mitigation-related projects.

[All of these are straight out of the 2014 HMP. Any updates or additions?]

Water Resources Advisory Committee (WRAC): The WRAC was established to advise the District Board of Supervisors concerning all policy decisions relating to the water resources of the FCWCD, recommend to the Board specific water resource programs, and to recommend methods of financing water resource program. The WRAC includes representatives from all five supervisorial districts, cities, community services districts (CSD), resource conservation districts, water purveyors, water resource management agencies, institutions such as Cuesta College and California Men's Colony, and at-large members representing agriculture, development, and environmental interests.

State Water Project: In 1963, the District entered into an agreement with the Department of Water Resources (DWR) for 25,000 acre-feet per year (AFY) of State Water Allocation. Between 1994-1998, the Central Coast Water Authority (CCWA) built the Polonio Pass Water Treatment Plant and contracted with the District for water treatment plant and pipeline operation and maintenance. In 1997, the District developed drought buffer agreements with State Water subcontractors in the county to increase reliability of deliveries during dry years.

2012 Master Water Report: The 1972 Master Water and Sewerage Plan was initially adopted by the Board in 1972 and was updated in 1986, 1998 and 2012 (renamed as the 2012 Master Water Report) to address water resource issues. Since the 1998 update, there have been major changes in the water resources profile for the County. the construction of the State Water and Nacimiento pipelines, groundwater basin litigation, new water users, new water regulations, formation of the Integrated Regional Water Management Program, and the completion of various local and sub-regional water management studies and plans. Consequently, development of a new County's Master Water Plan (later renamed as the Master Water Report) in 2012 was needed to ensure effective management of the County's water resources now and into the future.

Nacimiento Pipeline Project: The District, in partnership with five area water purveyors, establish a Nacimiento Commission for the purpose of utilizing 17,500 Acre-Feet of water supply available at the Nacimiento Reservoir. The project lead to the construction of a 42-mile-long pipeline with supporting facilities at a cost of \$ 176 million. Beginning in 2009, the project delivered water to the Cities of Atascadero, Paso Robles and San Luis Obispo; The Templeton Community Services District; and through a water exchange agreement to the County Service Area 10A system in Cayucos.

The Nacimiento Commission, composed of the five water purveyors, provides oversight of the project and water deliveries, however, the facility is owned and operated by the Flood Control and Water Conservation District.

Integrated Regional Water Management (IRWM) Plan: Led by the County, this plan is a collaborative effort to manage all aspects of water resources in a region. The IRWM Plan presents a comprehensive water resources management approach to managing the region's water resources focused on strategies to better the





sustainability of the current and future needs of San Luis Obispo County. It is built on the existing foundation of the region's longstanding inter-agency cooperation and stakeholder collaboration.

Drainage Studies: In 2001, the County Board of Supervisors approved funding for Drainage and Flood Control Studies for the communities of Cambria, Cayucos, Nipomo, Oceano, San Miguel, and Santa Margarita. These reports summarize findings, conclusions and recommendations for each of the studies. This effort is being led by the County, however the District is currently developing a drainage and flood control study for the community of Templeton.

Table S.2 Summary of Review of Key Plans, Studies and Reports

Plan, Study, Report Name	How Document Informed the Annex
San Luis Obispo County Flood Control and Water Conservation District Guide to Implementing Flood Control Projects	Process descriptions and capabilities

S.2 Hazard Identification and Summary

The District's Planning Team identified the hazards that affect the District and summarized their frequency of occurrence, spatial extent, potential magnitude, and significance specific to the Flood Control and Water Conservation District (see Table S.3). There are no hazards that are unique to the FCWCD.




Table S.3 Flood Control and Water Conservation District Hazard Risk Summary

Hazard	Geographic Area	Probability of Future Occurrence	Magnitude/Severity (Extent)	Overall Significance
Adverse Weather: Thunderstorm/ Heavy Rain/Hail/Lighting/Dense Fog/Freeze	Significant	Highly Likely	Negligible	Low
Adverse Weather: High Wind/Tornado	Limited	Likely	Negligible	Low
Adverse Weather: Extreme Heat	Extensive	Occasional	Negligible	Low
Agricultural Pest Infestation and Disease	Limited	Highly Likely	Negligible	Low
Biological Agents (naturally occurring)	Extensive	Occasional	Critical	Low
Coastal Storm/Coastal Erosion/Sea Level Rise	Limited	Likely	Limited	Medium
Dam Incidents	Limited	Occasional	Critical	Medium
Drought and Water Shortage	Extensive	Likely	Critical	High
Earthquake	Extensive	Occasional	Critical	High
Flood	Significant	Likely	Critical	Medium
Landslides and Debris Flow	Significant	Likely	Critical	Medium
Subsidence	Significant	Occasional	Negligible	Low
Tsunami and Seiche	Significant	Occasional	Critical	Medium
Wildfire	Extensive	Likely	Critical	High
Human Caused: Hazardous Materials	Significant	Highly Likely	Negligible	Medium
Geographic Area Limited: Less than 10% of planning area Significant: 10-50% of planning area Extensive: 50-100% of planning area Probability of Future Occurrences Highly Likely: Near 100% chance of occurrence in next year or happens every year. Likely: Between 10 and 100% chance of occurrence in next year or has a recurrence interval of 10 years or less. Occasional: Between 1 and 10% chance of occurrence in the next year or has a recurrence interval of 11 to 100 years. Unlikely: Less than 1% chance of occurrence in next 100 years or has a recurrence interval of greater than every 100 years.		Magnitude/Severity (Extent) Catastrophic—More than 50 percent of property severely damaged; shutdown of facilities for more than 30 days; and/or multiple deaths Critical—25-50 percent of property severely damaged; shutdown of facilities for at least two weeks; and/or injuries and/or illnesses result in permanent disability Limited—10-25 percent of property severely damaged; shutdown of facilities for more than a week; and/or injuries/illnesses treatable do not result in permanent disability Negligible—Less than 10 percent of property severely damaged, shutdown of facilities and services for less than 24 hours; and/or injuries/illnesses treatable with first aid Significance Low: minimal potential impact Medium: moderate potential impact High: widespread potential impact		





S.3 Vulnerability Assessment

The intent of this section is to assess the San Luis Obispo Flood Control and Water Conservation District's vulnerability separate from that of the overall planning area, which has already been assessed in Section 5 Hazard Identification and Risk Assessment in the Base Plan. This vulnerability assessment analyzes the population, property, and other assets at risk to hazards ranked of medium or high significance that may vary from other parts of the planning area.

The information to support the hazard identification and risk assessment for this Annex was based on the 2014 County HMP supplemented with information collected through a Data Collection Guide, which was distributed to each participating municipality or special district to complete during the planning process. Information collected was analyzed and summarized in order to identify and rank all the hazards that could impact anywhere within the County, as well as to rank the hazards and identify the related vulnerabilities unique to each jurisdiction. In addition, the FCWCD planning team members were asked to share information on past hazard events that have affected the District.

Each participating jurisdiction was in support of the main hazard summary identified in the Base Plan (see Table 5.2). However, the hazard summary rankings for each jurisdictional annex may vary slightly due to specific hazard risk and vulnerabilities unique to that jurisdiction (See Table S.3). Identifying these differences helps the reader to differentiate the jurisdiction's risk and vulnerabilities from that of the overall County.

Note: The hazard "Significance" reflects overall ranking for each hazard and is based on the FCWCD planning team input from the Data Collection Guide and the risk assessment developed during the planning process (see Section 5 of the Base Plan), which included a more detailed qualitative analysis with best available data.

The hazard summaries in Table S.3 reflect the hazards that could potentially affect the District. Based on this analysis, the priority hazards (High Significance) for mitigation are coastal storm/coastal erosion/sea level rise, and hazardous materials. The discussion of vulnerability for each of the following hazards is in subsection S.3.2 Estimating Potential Losses. Those of Medium or High Significance for the San Luis Obispo Flood Control and Water Conservation District are identified below.

- Coastal Storm/Coastal Erosion/Sea Level Rise
- Dam Incidents
- Drought and Water Shortage
- Earthquake
- Flood
- Landslides and Debris Flow
- Tsunami and Seiche
- Wildfire
- Human Caused: Hazardous Materials

Since the District's planning area is the entire extent of the county many hazards are noted here. However, due to the District's focus on flood control and water conservation, flood and drought/water shortage hazards are the priority for mitigation as the other hazards are under the purview of the County and Base Plan.

Other Hazards

Hazards assigned a significance rating of Low and those which do not differ significantly from the County ranking (e.g., Low vs. High) are not addressed further in this plan and are not assessed individually for specific





vulnerabilities in this section. The District planning team ranked the following hazards as a low significance to the District.

- Adverse Weather: Thunderstorm/ Heavy Rain/Hail/Lighting/Dense Fog/Freeze
- Adverse Weather: High Wind/Tornado
- Adverse Weather: Extreme Heat
- Agricultural Pest Infestation and Disease
- Biological Agents (naturally occurring)
- Subsidence

S.3.1 Assets at Risk

This section considers the District's assets at risk, including values at risk, critical facilities and infrastructure.

Values at Risk

Properties and infrastructure owned or operated by the San Luis Obispo County Flood Control and Water Conservation District were inventoried as part of the 2014 San Luis Obispo County HMP update and are considered critical to the community. The list of assets is attached to this Annex and notes specific hazard concerns where applicable.

S.3.2 Estimating Potential Losses

Note: This section details vulnerability to specific hazards of high or medium significance, where quantifiable, and/or where (according to HMPC member input) it differs from that of the overall County.

Impacts of past events and vulnerability to specific hazards are further discussed below (see subsection 5.1 Hazard Identification for more detailed information about these hazards and their impacts on the County as a whole).

Adverse Weather: Thunderstorm/Heavy Rain/Hail/Lighting/Dense Fog/Freeze

The District's risk and vulnerability to this hazard does not differ substantially from that of the County overall. Damage to District facilities due to severe storms and hail are possible.

Agricultural Pest Infestation and Disease

The District's risk and vulnerability to this hazard does not differ substantially from that of the County overall. As noted in the subsection 5.3.5 of the Base Plan, zebra mussels can accumulate in waterways, clogging pipes and damaging equipment used for drinking water and irrigation.

Biological Agents (Naturally Occurring)

The District's risk and vulnerability to this hazard does not differ substantially from that of the County overall. subsection 5.3.6 of the County Plan discusses waterborne illnesses and the impact they can have on public health if left untreated.

Drought and Water Shortage

The District's risk and vulnerability to this hazard does not differ substantially from that of the County overall. Drought impacts can include water shortfalls for facility operations and critical functions, as well as potential structural destabilization and damage resulting from land subsidence.





Earthquake

Water distribution systems by their nature are highly vulnerable to earthquakes. Tables 10-13 in subsection 5.3.10 of the County Plan shows Hazus damage estimates to water distribution lines and facilities from a major earthquake could total \$240 million. Flood control structures and levees could also be damaged from earthquakes.

Flood

Risk and vulnerabilities of the planning area to flooding are described in detail in subsection 5.3.11 of the County Plan.

SLO FCWCD does not participate separately in the National Flood Insurance Program (NFIP) but will continue to support the County's participation in and compliance with the NFIP.

Landslides and Debris Flow

Landslides can damage water distribution systems in two general ways: 1) disruption of pipes and structures caused by differential movement and deformation of the ground, and 2) physical impact of debris moving downslope against pipes and structures located in the travel path. Landslides and debris flows can also contaminate above ground water supplies.

Coastal Storm/Coastal Erosion/Sea Level Rise

District facilities and properties on or near the coastline are highly vulnerable to impacts from coastal storms, coastal erosion, and sea level.

Tsunami

District facilities and properties on or near the coastline are highly vulnerable to damage from Tsunamis.

Wildfire

The District's risk and vulnerability to this hazard does not differ substantially from that of the County overall.

Human Caused: Hazardous Materials

The District's risk and vulnerability to this hazard does not differ substantially from that of the County overall.

S.4 Capability Assessment

Capabilities are the programs and policies currently in use to reduce hazard impacts or that could be used to implement hazard mitigation activities. This capability assessment is divided into five sections: regulatory mitigation capabilities, administrative and technical mitigation capabilities, fiscal mitigation capabilities, mitigation outreach and partnerships, and other mitigation efforts.

To develop this capability assessment, the jurisdictional planning representatives used a matrix of common mitigation activities to inventory policies or programs in place. The team then supplemented this inventory by reviewing additional existing policies, regulations, plans, and programs to determine if they contributed to reducing hazard-related losses.

During the plan update process, this inventory was reviewed by the jurisdictional planning representatives and Wood consultant team staff to update information where applicable and note ways in which these capabilities have improved or expanded. In summarizing current capabilities and identifying gaps, the jurisdictional planning





representatives also considered their ability to expand or improve upon existing policies and programs as potential new mitigation strategies. The FCWCD capabilities are summarized below.

S.4.1 Regulatory Mitigation Capabilities

Table S.4 identifies existing regulatory capabilities the District has in place to help with future mitigation efforts. Note that many of the regulatory capabilities that can be used for the District are within the County's jurisdiction. Refer to Section 6 Capability Assessment of the Base Plan for specific information related to the County's mitigation capabilities.

Table S.4 FCWCD Regulatory Mitigation Capabilities

Regulatory Tool	Yes/No	Comments
San Luis Obispo County Flood Control and Water Conservation District Act	Yes	Various authorities for actions
Zoning ordinance	No	
Subdivision ordinance	No	
Growth management ordinance	No	
Floodplain ordinance	No	
Other special purpose ordinance (stormwater, water conservation, wildfire)	No	
Building code	No	
Fire department ISO rating	No	
Erosion or sediment control program	No	
Stormwater management program	No	
Site plan review requirements	No	
Capital improvements plan	No	
Economic development plan	No	
Local emergency operations plan	Yes	Dam failure response plans, Arroyo Grande Creek Levees
Other special plans	Yes	Integrated Regional Water Management Plan
Flood Insurance Study or other engineering study for streams	No	
Elevation certificates (for floodplain development)	No	

Source: Wood Data Collection Guide, 2019

S.4.2 Administrative/Technical Mitigation Capabilities

Table S.5 identifies the personnel responsible for activities related to mitigation and loss prevention in the FCWCD.

**Table S.5 FCWCD Administrative/Technical Mitigation Capabilities**

Personnel Resources	Yes/No	Department/Position
Planner/engineer with knowledge of land development/land management practices	Yes	Planning/Public Works/Division Managers
Engineer/professional trained in water resources management	Yes	Public Works Engineer IV
Planner/engineer/scientist with an understanding of natural hazards	Yes	Public Works/Engineer IV
Personnel skilled in GIS	Yes	Public Works/Principle GIS Analyst
Full time building official	No	
Floodplain manager	No	
Emergency manager	No	
Grant writer	Yes	Public Works/Engineer IV/Consultants
Other personnel	Yes	Public Works/Finance/Legal
GIS Data Resources (Hazard areas, critical facilities, land use, building footprints, etc.)	Yes	Public Works/Principle GIS Analyst
Warning systems/services (hydrologic data collection sites, telemetry)	Yes	Public Works/Engineer IV

Source: Wood Data Collection Guide, 2019

S.4.3 Fiscal Mitigation Capabilities

Table S.6 identifies financial tools or resources the District could potentially use to help fund mitigation activities.

Table S.6 FCWCD Fiscal Mitigation Capabilities

Financial Resources	Accessible/Eligible to Use (Yes/No)
Community Development Block Grants	No
Capital improvements project funding	Yes
Authority to levy taxes for specific purposes	Yes
Fees for water, sewer, gas, or electric services	No
Impact fees for new development	No
Incur debt through general obligation bonds	Yes
Incur debt through special tax bonds	Yes
Incur debt through private activities	No
Withhold spending in hazard prone areas	No

S.4.4 Implemented Mitigation Projects

Arroyo Grande Cheek Channel: The Flood Control and Water Conservation District has developed a Waterway Management Plan to enhance the capacity and maintenance of the channel while addressing retaining critical creek habitat. The project has funding under both Proposition 1E funds and Proposition 84 funding under the IRWM. Work is expected to commence in 2019 to provide a five-year recurrence design storm and provide on-going maintenance. Subsequent phases will look toward enhancement of the existing levees to add additional capacity and reduce flooding potential, particular along the north side levee in the community of Oceano.





Meadow Creek Lagoon: Meadow Creek Lagoon is situated just behind the Arroyo Grande Creek Channel levee in the Town of Oceano. Flow into Arroyo Grande Creek is regulated by flap gates, which when the Arroyo Grande Creek is not flowing to the ocean can cause pronounced rise in lagoon elevations with impacts to surrounding residential properties. Part of the plan to reducing flooding risk is to manage flows into the lagoon. On project, the Route 1 at 13th Storm Drain project, is currently being developed for construction in 2019/20. The project would divert flows from the lagoon into large detention basins to the east. Project funding is coming from State Transportation Funds and Community Block Grants.

S.4.5 Mitigation Outreach and Partnerships

The District runs a responsible water use outreach program to encourage conservation and efficiency by sending out public notices for water conservation and responsible water use with monthly water and sewer bills.

S.4.6 Opportunities for Enhancement

Based on the capabilities assessment, the FCWCD has several existing mechanisms in place that already help to mitigate hazards. There are also opportunities for the District to expand or improve on these policies and programs to further protect the community. Future improvements may include providing training for staff members related to hazards or hazard mitigation grant funding in partnership with the County and Cal OES. Additional training opportunities will help to inform District staff and board members on how best to integrate hazard information and mitigation projects into the District policies and ongoing duties of the District. Continuing to train District staff on mitigation and the hazards that pose a risk to the FCWCD will lead to more informed staff members who can better communicate this information to the public.

S.5 Mitigation Strategy

S.5.1 Mitigation Goals and Objectives

The District adopts the hazard mitigation goals and objectives developed by the HMPC and established in Section 7 of the Base Plan.

S.5.2 Completed and Deleted 2014 Mitigation Actions

The FCWD has not completed any mitigation actions from the 2014 LHMP, although of the District's five mitigation actions, four (4) are in progress to be completed. The planning team determined the following mitigation action from the previous action plan could be deleted:

Action 4.G Develop GIS mapping of flood areas to show property loss (potential and historical)

The County Public Works GIS team provides mapping support for FCWD efforts including incorporating FEMA GIS layers (e.g., SFHAs), delineated watershed boundaries, and geospatial data such as LOMAs/LOMRs, Elevation Certificates, etc. However, property loss information has not been shown. This action was recommended to be removed because the recommendations of the community drainage studies include long-term solutions to address property loss due to flooding.





S.5.3 Mitigation Actions

The planning team for the District identified and prioritized the following mitigation actions based on the risk assessment. The Flood Control and Water Conservation District was established to address flood mitigation and water quantity/quality. As such, hazards other than flood and drought are outside the District's purview and are not addressed by mitigation actions. Because the FCWCD's footprint is countywide, and is managed by County Public Works staff as a sub-district of the County, mitigation actions against other hazards in the base plan and other annexes also serve to mitigate those hazards for the FCWCD.

Actions were prioritized using the process described in subsection 7.2.1 of the Base Plan. Background information and information on how each action will be implemented and administered, such as ideas for implementation, responsible office, potential funding, estimated cost, and timeline are also included. Actions with an '*' are those that mitigate losses to future development.



**Table S.7 San Luis Obispo Flood Control and Water Conservation District Mitigation Action Plan**

ID	Hazard(s) Mitigated	Description/Background/Benefits	Lead Agency and Partners	Cost Estimate	Potential Funding	Priority	Timeline	Status/ Implementation Notes
FCWCD. 1	Flood	Review and revise the policies of the San Luis Obispo County Flood Control and Water Conservation District to help reduce the exposure to flood hazards	Flood Control and Water Conservation District	Little to no cost	Staff Time/ Dept. Budget	Medium	1 yr.	In progress
FCWCD. 2	Flood	Identify flood prone areas within communities and define mitigation options under Community Drainage Studies. Engage stakeholders in defining, funding, and implementing community drainage facilities.	Flood Control and Water Conservation District	Little to no cost	Staff Time/ Dept. Budget	High	1 yr.	In progress. Drainage facility projects are identified in the community drainage studies. Implementation is in progress. The following projects identified in the studies are under development: Hwy 1 at 13th Street drainage (Oceano), Salinas Avenue drainage (Templeton), Mallagh Street drainage (Nipomo), Mountain Springs Road sedimentation basin (Paso Robles). Revise to: Continue to develop and update the community drainage studies and prioritize and implement the recommended solutions.
FCWCD. 3	Flood	Continue to update and enhance Emergency Response Plan for Arroyo Grande Creek Levee System. Develop safeguards for levee protection. Implement Arroyo Grande Waterway Management Plan to maximize floodway capacity of the facility.	Flood Control and Water Conservation District	Little to no cost	Staff Time/ Dept. Budget	High	1 yr.	In progress. The County's Dam and Levee Failure Plan, which covers the Arroyo Grande Creek Levee, was updated in February 2015 and February 2016. The Arroyo Grande Creek Levee Failure Emergency Response Plan was updated in March 2016. Revisions include: revised checklists to reflect actual response actions; divided checklists by position; updated figures and



ID	Hazard(s) Mitigated	Description/Background/Benefits	Lead Agency and Partners	Cost Estimate	Potential Funding	Priority	Timeline	Status/ Implementation Notes
								<p>maps to reflect current conditions; updated emergency contact information; added Appendix 3: Radio Procedures and Call List; added Appendix 6: Personal Safety Plan. The District has continued to work cooperatively with the State and Federal funding agencies for implementing flood related improvements. The District has been awarded the following grants: Proposition 1E Stormwater Flood Management Grant (\$2.8M, 2013) Proposition 84 IRWM Implementation Grant (\$2.2M, 2013) FEMA Hazard Mitigation Grant (\$3.0M, 2018)</p> <p>The Oceano Drainage Improvement Project (Hwy 1 at 13th Street) is funded by various state and federal grants.</p>
FCWCD. 4	Flood	Continue to work cooperatively with the state and federal flood related agencies for funding improvements through grant and agency programs	Flood Control and Water Conservation District	Little to no cost	FEMA HMA/ Staff Time/ Dept. Budget	High	Ongoing	In progress
FCWCD 5.	Drought	Develop a Regional Water Infrastructure Resiliency Plan to identify key interconnections to construct and agreements to get water from where it	Flood Control and Water Conservation District	\$75,000	FCWCD	High	1-2 yr.	New





ID	Hazard(s) Mitigated	Description/Background/Benefits	Lead Agency and Partners	Cost Estimate	Potential Funding	Priority	Timeline	Status/ Implementation Notes
		is to where it is needed to mitigate water shortages and drought impacts						
FCWCD 6	Dam Incidents	Perform destructive testing of the Lopez Dam to quantify previous investigation data and direct what repairs are needed. Conduct geotechnical investigation on Lopez Terminal Dam.	FCWCD, DSOD	\$450,000	FEMA-HHPD	High	TBD (pending DSOD review and approval of previous non-destructive testing assessment.)	The Lopez Dam and Lopez Terminal Dam are considered to be a high hazard dams by the Dept. of Safety of Dams (DSOD) due to the large population downstream. DSOD mandated that all spillways of High Hazard Dams be investigated for structural integrity and design. Preliminary studies have shown that although the Lopez Dam spillway is in fair condition it needs repairs related to spillway under drains, crack repair, spalling concrete repair, and various other maintenance items that will insure that the spillway performs well in a spill event. The Lopez Terminal Dam seismic assessment is in process.





S.6 Implementation and Maintenance

Moving forward, the San Luis Obispo Flood Control and Water Conservation District will use the mitigation action table in the previous section to track progress on implementation of each project. Implementation of the plan overall is discussed in Section 8 in the Base Plan.

S.6.1 Incorporation into Existing Planning Mechanisms

The information contained within this plan, including results from the Vulnerability Assessment, and the Mitigation Strategy will be used by the District to help inform updates of FCWCD plans, and in the development of additional plans, programs and policies. Understanding the hazards that pose a risk and the specific vulnerabilities of the District will help in future capital improvement planning for the FCWCD. The District may utilize the hazard information when reviewing a site plan or other type of development applications with the boundaries of the FCWCD area. As noted in Section 8 Plan Implementation, the HMPC representatives from the FCWCD will report on efforts to integrate the hazard mitigation plan into local plans, programs and policies and will report on these efforts at the annual HMPC plan review meeting.

S.6.2 Monitoring, Evaluation and Updating the Plan

The FCWCD will follow the procedures to Monitor, review, and update this plan in accordance with San Luis Obispo County as outlined in Section 8 of the Base Plan. The District will continue to involve the public in mitigation, as described in subsection 8.3 of the base plan. The Deputy Directors of County Public Works will be responsible for representing the District in the County HMPC, and for coordination with County staff and departments during plan updates. The San Luis Obispo Flood Control and Water Conservation District realizes it is important to review the plan regularly and update it every five years in accordance with the Disaster Mitigation Act Requirements as well as other State of California requirements.

S.7 Attachments

Attachment A: District Assets at Risk from Applicable Hazards





ATTACHMENT A: Flood Control and Water Conservation District Assets at Risk from Applicable Hazards

Flood Control and Water Conservation District (FCWCD) Properties	Asset Location (Latitude and Longitude)	Total Value in Dollars (K for thousands or M for millions)	Total Land Area (in Acres)	Wildfire	Floods	Adverse Weather	Tsunami	Earthquake	Fault Rupture/ Groundshaking / Liquefaction	Coastal Storm / Coastal Erosion	Landslides	Naturally-Occurring Biological Agents	Agricultural Pest Infestation and Plant Disease
017-292-001(SLO CO FLOOD CONTROL & WATER CONS DIST) TRACT 1639 LT 1	35.6551°N, 120.3852°W	\$0	0.46			X		X	X		X	X	X
020-282-012(SLO CO FLOOD CONTROL & WATER CONS DIST) PM 56-39 PTN PARS 148 & 150	35.5824°N - 120.6817°W	\$0	1			X		X	X		X	X	X
021-012-032(SLO CO FLOOD CONTROL & WATER CONS DIST) PM 50-94 PAR 88	35.7616°N - 120.6972°W	\$0	0.2			X		X	X		X	X	X
021-013-048(SLO CO FLOOD CONTROL & WATER CONS DIST) PM 50-94 PAR 67	35.7596°N 4- 120.6961°W	\$0	0.12			X		X	X		X	X	X
022-122-039(SLO CO FLOOD CONTROL & WATER CONS DIST) CAM PINES U7 PTN LTS 116-121 & PTN RD	35.5681°N - 121.1019°W	\$79,371	0.1	X	AE	X	X	X	X	X	X	X	X
022-126-034(SLO CO FLOOD CONTROL & WATER CONS DIST)000.50AC VACANT	35.5661°N - 121.1001°W	\$0	1.78	X	A	X	X	X	X	X	X	X	X
027-221-034(FLOOD CONTROL ZONE 16) T25S R12E PTN SEC 21	35.7471°N - 120.6851°W	\$380	0.06	X		X		X	X		X	X	X
027-221-035(FLOOD CONTROL ZONE 16) T25S R12E PTN SEC 21	35.7464°N 2- 120.6849°W	\$0	2.15	X		X		X	X		X	X	X
034-431-049(SLO CO FLOOD CONTROL & WATER CONS DIST) PM 20/12 PTN PAR B	35.4757°N - 120.6226°W	\$190,931	3.08	X		X		X	X		X	X	X





Flood Control and Water Conservation District (FCWCD) Properties	Asset Location (Latitude and Longitude)	Total Value in Dollars (K for thousands or M for millions)	Total Land Area (in Acres)	Wildfire	Floods	Adverse Weather	Tsunami	Earthquake	Fault Rupture/ Groundshaking / Liquefaction	Coastal Storm / Coastal Erosion	Landslides	Naturally-Occurring Biological Agents	Agricultural Pest Infestation and Plant Disease
044-571-006(COUNTY SERVICE AREA 18) TR 1241-1 LT 100	35.2143°N - 120.6300°W	\$0	3.72			X		X	X		X	X	X
046-191-061(SLO CO FLOOD CONTROL & WATER CONS DIST) PTN MORRO RK VW NO 1 & PTN TN CAY	35.4521°N - 120.8999°W	\$0	2.93			X	X	X	X	X	X	X	X
047-021-013(FLOOD CONTROL ZONE 3)100.26AC VACANT	35.1850°N - 120.4827°W	\$0	61.23			X		X	X		X	X	X
047-081-044(FLOOD CONTROL ZONE 3)120.95AC FILTRATION PLANT PTN	35.1779°N - 120.5365°W	\$0	26.81			X		X	X			X	X
047-081-045(FLOOD CONTROL ZONE 3)120.95AC FILTRATION PLANT PTN	35.1731°N - 120.5351°W	\$0	104.57	X		X		X	X			X	X
047-081-050(FLOOD CONTROL ZONE 3)025.06AC FILTRATION PLANT PTN	35.1691°N 2- 120.5343°W	\$0	30.61	X		X		X	X			X	X
047-125-022(FLOOD CONTROL ZONE 3) RHO COR DE P STEELE SB PTN LT 3	35.1400°N - 120.5465°W	\$0	0.34		AE with Floodway	X		X	X			X	X
048-031-034(FLOOD CONTROL ZONE 3)037.76AC VACANT	35.2144°N - 120.4861°W	\$0	32.91	X		X		X	X		X	X	X
048-031-036(FLOOD CONTROL ZONE 3)370.00AC VACANT	35.2116°N - 120.4776°W	\$0	402.48	X		X		X	X		X	X	X
048-031-037(FLOOD CONTROL ZONE 3)585.00AC VACANT	35.2094°N - 120.4964°W	\$0	552.4	X		X		X	X		X	X	X
048-041-026(FLOOD CONTROL ZONE 3)186.00AC VACANT	35.2240°N - 120.4747°W	\$0	192.16	X		X		X	X		X	X	X





Flood Control and Water Conservation District (FCWCD) Properties	Asset Location (Latitude and Longitude)	Total Value in Dollars (K for thousands or M for millions)	Total Land Area (in Acres)	Wildfire	Floods	Adverse Weather	Tsunami	Earthquake	Fault Rupture/ Groundshaking / Liquefaction	Coastal Storm / Coastal Erosion	Landslides	Naturally-Occurring Biological Agents	Agricultural Pest Infestation and Plant Disease
048-051-019(FLOOD CONTROL ZONE 3)583.00AC VACANT	35.2083°N - 120.4575°W	\$0	565.97	X		X		X	X		X	X	X
048-061-013(FLOOD CONTROL ZONE 3)040.00AC VACANT	35.2033°N - 120.5079°W	\$0	37.9	X		X		X	X		X	X	X
048-061-015(FLOOD CONTROL ZONE 3) T31S R14E PTN SEC 34 LESS 40% MIN RTS	35.1776°N - 120.4544°W	\$0	1.76	X		X		X	X		X	X	X
048-061-057(FLOOD CONTROL ZONE 3)353.00AC VACANT	35.1867°N - 120.4628°W	\$0	342.17	X		X		X	X		X	X	X
048-061-058(FLOOD CONTROL ZONE 3)639.00AC VACANT	35.1918°N - 120.4816°W	\$0	639.27	X		X		X	X		X	X	X
048-061-059(FLOOD CONTROL ZONE 3)304.00AC VACANT	35.2022°N - 120.4827°W	\$0	282.19		A	X		X	X		X	X	X
048-071-016(FLOOD CONTROL ZONE 3)366.00AC RECREATION	35.1953°N - 120.4612°W	\$0	390.58	X		X		X	X		X	X	X
048-071-017(FLOOD CONTROL ZONE 3)624.00AC VACANT	35.1961°N - 120.4485°W	\$0	592.27	X		X		X	X		X	X	X
048-101-001(FLOOD CONTROL ZONE 3)150.00AC VACANT	35.2002°N - 120.4731°W	\$0	148.51	X		X		X	X		X	X	X
048-101-002(FLOOD CONTROL ZONE 3)025.27AC UNDER LOPEZ LAKE	35.1927°N - 120.4741°W	\$0	26		A	X		X	X		X	X	X
061-082-002(FLOOD CONTROL ZONE 1)000.25AC VACANT	35.1022°N - 120.6267°W	\$0	0.33		AE	X	X	X	X			X	X
061-093-038(FLOOD CONTROL ZONE 1)004-094 AC	35.1008°N - 120.6265°W	\$0	3.61		AE	X	X	X	X			X	X





Flood Control and Water Conservation District (FCWCD) Properties	Asset Location (Latitude and Longitude)	Total Value in Dollars (K for thousands or M for millions)	Total Land Area (in Acres)	Wildfire	Floods	Adverse Weather	Tsunami	Earthquake	Fault Rupture/ Groundshaking / Liquefaction	Coastal Storm / Coastal Erosion	Landslides	Naturally-Occurring Biological Agents	Agricultural Pest Infestation and Plant Disease
061-161-012(FLOOD CONTROL ZONE 16)060.40AC	35.0984°N - 120.6230°W	\$0	1.26	X	AE	X	X	X	X	X		X	X
062-061-011(FLOOD CONTROL ZONE 16)000.11AC VACANT	35.1041°N - 120.6094°W	\$0	0.09			X	X	X	X			X	X
062-064-020(FLOOD CONTROL ZONE 16)000.15AC DRAINAGE BASIN	35.1032°N - 120.6087°W	\$0	0.15			X	X	X	X			X	X
062-104-012(FLOOD CONTROL ZONE 16) PM 50-65 PAR 10	35.1008°N - 120.6006°W	\$60,007	0.15			X	X	X	X			X	X
062-261-065(FLOOD CONTROL ZONE 16)000.14AC DRAINAGE	35.1063°N - 120.6104°W	\$0	0.14			X	X	X	X			X	X
062-304-016(FLOOD CONTROL ZONE 16) TR 2305 LT 16	35.0983°N - 120.5967°W	\$0	0.19			X	X	X	X			X	X
064-332-064(COUNTY SERVICE AREA 10A)000.13AC VACANT	35.4307°N - 120.8772°W	\$0	0.13			X	X	X	X	X	X	X	X
064-333-008(COUNTY SERVICE AREA 10A) MORRO STR 4 BL 56 LTS 13 & 14	35.4305°N - 120.8769°W	\$7,193	0.08			X	X	X	X	X	X	X	X
069-062-007(COUNTY SERVICE AREA 23) TN OF STA MARG PTN BLK 63 & PTN RD	35.3888°N - 120.6121°W	\$0	0.27			X		X	X			X	X
069-161-018(COUNTY SERVICE AREA 23) PM 25-4 PTN PAR 13	35.3893°N - 120.6012°W	\$6,891	0.25			X		X	X			X	X
073-094-001(COUNTY SERVICE AREA 10)001.14AC VACANT	35.4391°N - 120.8875°W	\$0	1.12			X	X	X	X		X	X	X
073-095-008(SLO CO FLOOD CONTROL & WATER CONS DIST) RHO MORRO CAY PTN LT 53	35.4449°N - 120.8912°W	\$0	7.97			X	X	X	X		X	X	X





Flood Control and Water Conservation District (FCWCD) Properties	Asset Location (Latitude and Longitude)	Total Value in Dollars (K for thousands or M for millions)	Total Land Area (in Acres)	Wildfire	Floods	Adverse Weather	Tsunami	Earthquake	Fault Rupture/ Groundshaking / Liquefaction	Coastal Storm / Coastal Erosion	Landslides	Naturally-Occurring Biological Agents	Agricultural Pest Infestation and Plant Disease
075-011-053(FLOOD CONTROL ZONE 1A)005.33AC VACANT	35.1036°N - 120.5851°W	\$0	5.08		AE	X	X	X	X			X	X
075-393-007(FLOOD CONTROL ZONE 1A)001.29AC VACANT	35.1031°N - 120.5785°W	\$0	1.22		AE with Floodway	X	X	X	X			X	X
080-091-023(SLO CO FLOOD CONTROL & WATER CONS DIST)002.457AC GRAZING	35.7607°N - 120.8873°W	\$0	2.4		A	X		X	X		X	X	X
085-012-031(SLO CO FLOOD CONTROL & WATER CONS DIST)024.69AC VACANT	35.0903°N - 120.3673°W	\$0	25.82	X	A	X		X	X		X	X	X
091-373-017(COUNTY SERVICE AREA 1D)000.46AC HOLDING POND	35.0350°N - 120.4964°W	\$0	0.46			X		X	X			X	X
091-382-016(FLOOD CONTROL ZONE 16) TR 1427 LT 16	35.0340°N - 120.4993°W	\$0	0.43			X		X	X			X	X
092-051-017(FLOOD CONTROL ZONE 4)004.82AC VACANT	34.9745°N - 120.5537°W	\$0	5.18		A	X	X	X	X		X	X	X
092-061-009(FLOOD CONTROL ZONE 4)013.77AC VACANT	34.9748°N - 120.5478°W	\$0	11.47		A	X	X	X	X		X	X	X
092-061-010(FLOOD CONTROL ZONE 4)004.87AC VACANT	34.9823°N - 120.5388°W	\$0	3.8		A	X	X	X	X		X	X	X
092-093-011(COUNTY SERVICE AREA 1)002.29AC DRAINAGE IMPOUND AREA	35.0168°N - 120.4929°W	\$0	2.28			X		X	X			X	X
092-094-004(COUNTY SERVICE AREA 1) LA MESA TR PTN LTS 15 & 16	35.0166°N - 120.4924°W	\$11,858	0.13			X		X	X			X	X
092-105-013(COUNTY SERVICE AREA 1)000.05AC ACCESS DRAINAGE IMPOUND AREA	35.0167°N - 120.4923°W	\$0	0.06			X		X	X			X	X





Flood Control and Water Conservation District (FCWCD) Properties	Asset Location (Latitude and Longitude)	Total Value in Dollars (K for thousands or M for millions)	Total Land Area (in Acres)	Wildfire	Floods	Adverse Weather	Tsunami	Earthquake	Fault Rupture/ Groundshaking / Liquefaction	Coastal Storm / Coastal Erosion	Landslides	Naturally-Occurring Biological Agents	Agricultural Pest Infestation and Plant Disease
092-107-023(FLOOD CONTROL ZONE 16)000.10AC SEWER TREATMENT & DISPOSAL SITE	35.0189°N - 120.4933°W	\$0	0.11			X		X	X			X	X
092-120-020(FLOOD CONTROL ZONE 16) TR 1658 LT 20	35.0316°N - 120.4931°W	\$6,235	0.29			X		X	X			X	X
092-126-001(FLOOD CONTROL ZONE 16) TR 1647 LT 1	35.0309°N - 120.4943°W	\$38,891	0.36			X		X	X			X	X
092-128-021(FLOOD CONTROL ZONE 16) TR 1805 LT 21	35.0310°N - 120.4901°W	\$0	0.21			X		X	X			X	X
092-128-040(FLOOD CONTROL ZONE 16) TR 1805 LT 40	35.0292°N - 120.4933°W	\$0	0.2			X		X	X			X	X
092-129-001(FLOOD CONTROL ZONE 16) TR 1700 LT 1	35.0304°N - 120.4905°W	\$37,439	0.15			X		X	X			X	X
092-136-055(FLOOD CONTROL ZONE 16) TR 2282 LT 10	35.0343°N - 120.4962°W	\$0	0.1			X		X	X			X	X
092-136-065(FLOOD CONTROL ZONE 16) TR 1792 LT 8	35.0343°N - 120.4946°W	\$0	0.13			X		X	X			X	X
092-137-022(FLOOD CONTROL ZONE 16) TR 1556 LT 22	35.0331°N - 120.4923°W	\$0	0.33			X		X	X			X	X
092-143-057(FLOOD CONTROL ZONE 16) TRACT 1445 LT 57	35.02590°N - 120.4843°W	\$0	0.4			X		X	X			X	X
092-144-020(FLOOD CONTROL ZONE 16) TR 1608 LT 20	35.0278°N - 120.4812°W	\$0	0.16			X		X	X			X	X





Flood Control and Water Conservation District (FCWCD) Properties	Asset Location (Latitude and Longitude)	Total Value in Dollars (K for thousands or M for millions)	Total Land Area (in Acres)	Wildfire	Floods	Adverse Weather	Tsunami	Earthquake	Fault Rupture/ Groundshaking / Liquefaction	Coastal Storm / Coastal Erosion	Landslides	Naturally-Occurring Biological Agents	Agricultural Pest Infestation and Plant Disease
092-145-040(FLOOD CONTROL ZONE 16) TRACT 1640 LT 40	35.0272°N - 120.4828°W	\$0	0.28			X		X	X			X	X
092-145-049(FLOOD CONTROL ZONE 16) MESA GRANDE TR PTN LT 20	35.0276°N - 120.4813°W	\$0	0.09			X		X	X			X	X
092-147-022(FLOOD CONTROL ZONE 16) TRACT 1627 LT 22	35.0288°N - 120.4799°W	\$0	0.3			X		X	X			X	X
092-183-012(FLOOD CONTROL ZONE 16) TR 1898-1 LT 58	35.0199°N - 120.4875°W	\$0	0.91			X		X	X			X	X
092-261-020(FLOOD CONTROL ZONE 16) TR 2530 LT 23	35.0348°N - 120.4807°W	\$0	0.31			X		X	X			X	X
092-291-055(COUNTY SERVICE AREA 1C) TR 458 LT 51	35.0269°N 8-120.4770°W	\$0	3.94			X		X	X			X	X
092-446-008(COUNTY SERVICE AREA 1)000.77AC VACANT	35.0159°N - 120.4996°W	\$0	1.56			X		X	X			X	X
092-453-001(FLOOD CONTROL ZONE 16)000.16AC WATER STORAGE	35.0192°N - 120.4933°W	\$0	0.16			X		X	X			X	X
092-462-050(COUNTY SERVICE AREA 1B)000.60AC STORM WATER DETENTION AREA	35.0242°N - 120.4824°W	\$0	0.13			X		X	X			X	X
092-463-032(COUNTY SERVICE AREA 1B)000.14AC SEWAGE DISPOSAL SITE TR 414 LT 73	35.0245°N - 120.4820°W	\$0	0.61			X		X	X			X	X
092-512-029(FLOOD CONTROL ZONE 16) TR 2409 LT 29	35.0257°N - 120.4957°W	\$0	0.53			X		X	X			X	X
092-532-018(FLOOD CONTROL ZONE 16) TR 1692 LT 22	35.0265°N - 120.4876°W	\$36,405	0.21			X		X	X			X	X





Flood Control and Water Conservation District (FCWCD) Properties	Asset Location (Latitude and Longitude)	Total Value in Dollars (K for thousands or M for millions)	Total Land Area (in Acres)	Wildfire	Floods	Adverse Weather	Tsunami	Earthquake	Fault Rupture/ Groundshaking / Liquefaction	Coastal Storm / Coastal Erosion	Landslides	Naturally-Occurring Biological Agents	Agricultural Pest Infestation and Plant Disease
092-533-028(FLOOD CONTROL ZONE 16) TR 1692 LT 58	35.0266°N - 120.4906°W	\$8,112	0.97			X		X	X			X	X
092-551-038(FLOOD CONTROL ZONE 16) TR 607 LT 28	35.0257°N - 120.4804°W	\$0	0.52			X		X	X			X	X
092-573-010(FLOOD CONTROL ZONE 16) TR 2299 LT 10	35.0285°N - 120.4945°W	\$0	0.2			X		X	X			X	X





T.1 District Profile

T.1.1 Mitigation Planning History and 2019 Process

This Annex was created during the development of the 2019 San Luis Obispo County Hazard Mitigation Plan Update. The South San Luis Obispo County Sanitation District was previously part of the Multi-Jurisdictional Local Hazard Mitigation Plan for the cities of Grover Beach, Arroyo Grande, and Lucia Mar Unified School District which was approved by FEMA in December 2015. The previous mitigation plan was not incorporated into other District planning mechanisms.

The Plant Superintendent of the South San Luis Obispo County Sanitation District (South SLO County Sanitation District, or the District) was the representative on the county Hazard Mitigation Planning Committee and took the lead for developing the plan and this annex in coordination with the South SLO District Local Planning Team (Planning Team). The local (District) Planning Team will be responsible for implementation and maintenance of the plan.

Table T.1 South San Luis Obispo County Sanitation District Hazard Mitigation Plan Planning Team

Department or Stakeholder	Title
South SLO County Sanitation District	Plant Superintendent
South SLO County Sanitation District	District Administrator

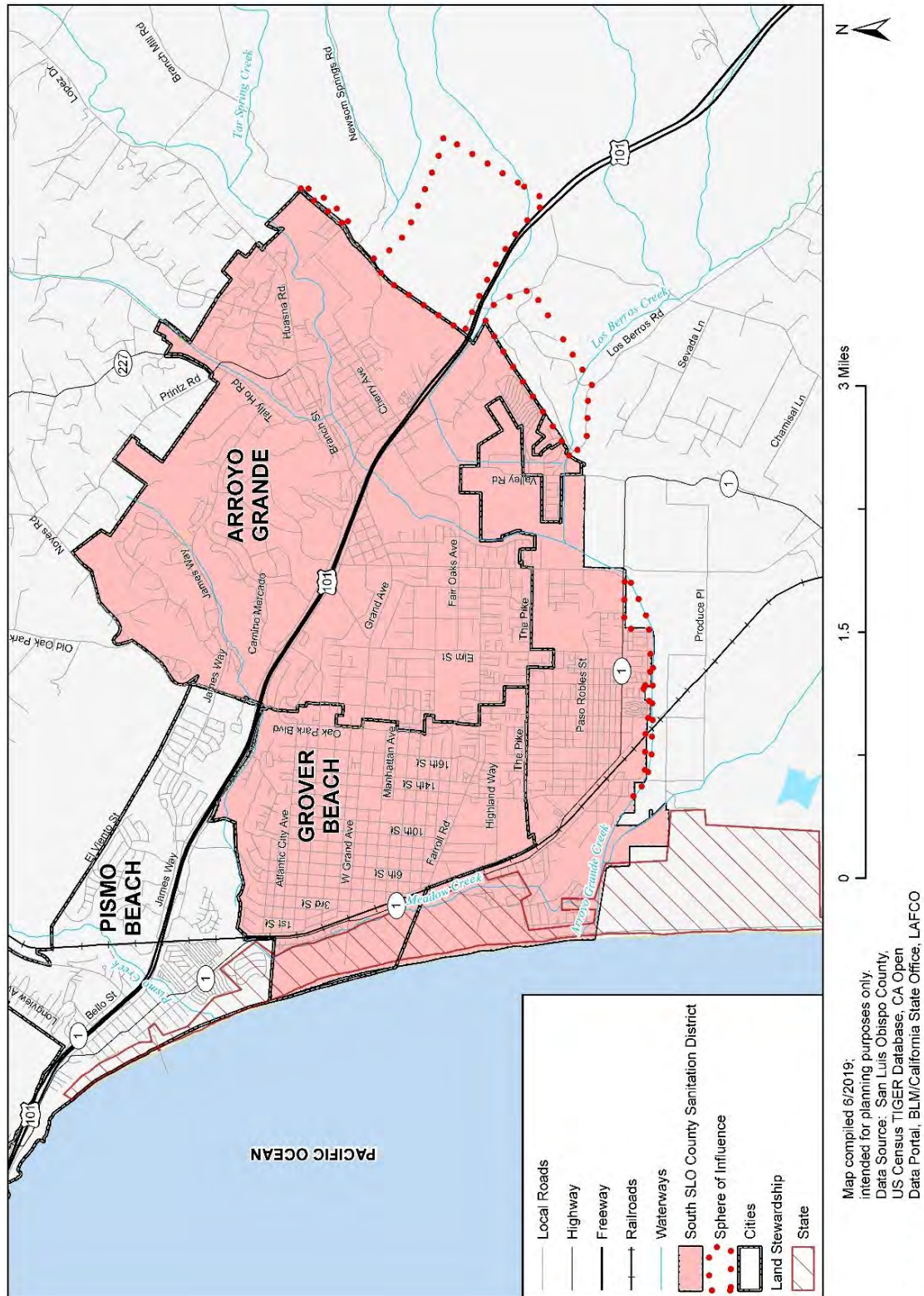
More details on the planning process followed and how the jurisdictions, service districts and stakeholders participated can be found in Section 3 of the Base Plan, along with how the public was involved during the 2019 update.

Figure T.1 below is a map showing the South SLO County Sanitation District including its sphere of influence and nearby areas.





Figure T.1 South San Luis Obispo County Sanitation District





T.1.2 District Overview

In 1958 the Grover City County Water Board commissioned several engineering studies aimed at investigating the rising nitrate levels observed in the local groundwater sources. At that time both Grover City and the Oceano community were entirely unsewered and depended on individual septic tanks. While Arroyo Grande had sewer systems at that time, said systems led to a wastewater treatment facility located at the "sewer farm," and the partially treated wastewater was disposed onto nearby lands. Because of the studies carried out upon that engineering commissioning, it was determined there was a need to better address the septic tank and sewer farm impacts on nearby lands and groundwater resources. To solve these issues, the South San Luis Obispo County Sanitation District was founded on September 3, 1963. Upon this new sanitation district development, nine miles of trunk sewer lines were built, as well as a new wastewater treatment plant and an ocean outfall line to get rid of the treated wastewater. To date, further improvements have taken place as well expansions in the wastewater systems. Key years when improvements, additions, or other constructions were incorporated into the District's infrastructure include 1978, 1979, 1986, 1990, and 2005.

Currently, the District provides wastewater collection, treatment and disposal services to the three-member agencies of Arroyo Grande, Grover Beach, and the Oceano Community Services District (CSD). The District is governed by a District Board composed of three members appointed by each of the member agencies. This Board makes policy and operational decisions based on recommendations of the District Administrator, engineers, and District staff, and establishes policies, goals, and objectives in the best interest of the District. It additionally approves budgets, expenditures, and related District functions.

The District's commitment to public health is focused on sound environmental design, educational opportunities, effectively working with homeowners and businesses, and appropriate and responsible construction mechanisms. The District engages in a fats, oils, and grease (FOG) safe release program as well as a pretreatment of chemicals and substances program to prevent the introduction of pollutants into the water and land, while protecting personnel from hazardous materials exposure. Currently the District's staff is composed of the District Administrator, a bookkeeper/secretary, and six operational staff.

T.1.3 Development Trends

Since the Sanitation District encompasses and provides services for Arroyo Grande, Grover Beach, and the Oceano Community Services District it is expected that development and changes in the community will follow those of the two cities and Service District (i.e. the Sanitation District's members). For more information on these member communities refer to the Base Plan as well as Annex A (Arroyo Grande), Annex C (Grover Beach), and Annex M (Oceano).

T.1.4 Other Community Planning Efforts

Coordination and synchronization with other community planning mechanisms and efforts are vital to the success of this Plan. To have a thorough evaluation of hazard mitigation practices already in place, appropriate planning procedures should also involve identifying and reviewing existing plans, policies, regulations, codes, tools, and other actions are designed to reduce a community's risk and vulnerability from natural hazards.

As an unincorporated community, the South SLO County Sanitation District is referenced in other County and City planning documents and regulated by County policies and planning mechanisms. Integrating existing planning efforts, mitigation policies, and action strategies into this annex establishes a credible, comprehensive document that weaves the common threads of a community's values together. The development of this Special District annex involved a comprehensive review of existing plans, studies, reports, and initiatives from San Luis Obispo County and the Sanitation District that relate to hazards or hazard mitigation. A high-level summary of





the key plans, studies and reports is summarized in Table T.2. Information on how they informed the update are noted and incorporated where applicable.

In addition to the development standards within the existing Local Hazard Mitigation Plans by Arroyo Grande and Grover Beach, there are County planning mechanisms that regulate future and existing development within the District's planning area. Refer to Sea Level Rise as well as Section 6 of the Base Plan for more information on the plans, policies, regulations and staff that govern the South SLO County Sanitation District.

Table T.2 Summary of Review of Key Plans, Studies, and Reports for the Sanitation District

Plan, Study, Report Name	How Document Informed the Annex
County of San Luis Obispo Local Hazard Mitigation Plan (2014)	Informed past hazard event history, hazard profile and background, and mitigation strategy information.
South SLO County Sanitation District 2018 Strategic Plan	Obtained current District information, ongoing efforts, water use information, etc.
San Luis Obispo County 2014 Integrated Regional Water Management Plan	Obtained information on water use in Nipomo, water management regions, and the drought/water scarcity hazard.
State of California's Hazard Mitigation Plan – Updated 2018	General information on hazards, events, and vulnerability assessments.
San Luis Obispo County Dam and Levee Failure Evacuation Plan – Updated 2016	Flooding, dam, and levee hazard information and recent studies.
2014-2016 Resource Summary Report for San Luis Obispo County's General Plan	Pulled information about water resources, reliability, and ongoing efforts to increase resilience in the county and District of Nipomo as related to drought.
Multi-Jurisdictional Local Hazard Mitigation Plan for the City of Arroyo Grande, City of Grover Beach, Lucia Mar Unified School District, and the South San Luis Obispo County Sanitation District - 2015	General background information on the Sanitation District and its member communities as well as hazards, events, mitigation capabilities, goals, etc.
Oceano Community Services District Local Hazard Mitigation Plan – 2018	General background information on the community as well as hazards, events, mitigation capabilities, goals, etc.

T.2 Hazard Identification and Summary

The Sanitation District Planning Team identified the key hazards that affect the District, and summarized their frequency of occurrence, spatial extent, potential magnitude, and overall significance specific to the District (see Table T.3: South SLO County Sanitation District Hazard Risk Summary). There are no hazards that are unique to this Sanitation District.



**Table T.3 South SLO County Sanitation District Hazard Risk Summary**

Hazard	Geographic Area	Probability of Future Occurrence	Magnitude/Severity (Extent)	Overall Significance
Agricultural Pest Infestation and Disease	Limited	Highly Likely	Negligible	Medium
Coastal Flood/Coastal Erosion/Sea Level Rise	Limited	Likely	Critical	Medium
Dam Incidents and Failure	Extensive	Unlikely	Catastrophic	Medium
Drought and Water Shortage	Significant	Likely	Limited	Low
Earthquake and Liquefaction	Significant	Highly Likely	Critical	High
Flood	Significant	Highly Likely	Limited	Medium
Tsunami and Seiche	Limited	Occasional	Limited	Low
Wildfire	Significant	Occasional	Limited	Low
Geographic Area Limited: Less than 10% of planning area Significant: 10-50% of planning area Extensive: 50-100% of planning area Probability of Future Occurrences Highly Likely: Near 100% chance of occurrence in next year or happens every year. Likely: Between 10 and 100% chance of occurrence in next year or has a recurrence interval of 10 years or less. Occasional: Between 1 and 10% chance of occurrence in the next year or has a recurrence interval of 11 to 100 years. Unlikely: Less than 1% chance of occurrence in next 100 years or has a recurrence interval of greater than every 100 years.		Magnitude/Severity (Extent) Catastrophic—More than 50 percent of property severely damaged; shutdown of facilities for more than 30 days; and/or multiple deaths Critical—25-50 percent of property severely damaged; shutdown of facilities for at least two weeks; and/or injuries and/or illnesses result in permanent disability Limited—10-25 percent of property severely damaged; shutdown of facilities for more than a week; and/or injuries/illnesses treatable do not result in permanent disability Negligible—Less than 10 percent of property severely damaged, shutdown of facilities and services for less than 24 hours; and/or injuries/illnesses treatable with first aid Significance Low: minimal potential impact Medium: moderate potential impact High: widespread potential impact		

T.3 Vulnerability Assessment

The intent of this section is to assess the Sanitation District's vulnerability separately from that of the County, which has already been assessed in Section 5 Hazard Identification and Risk Assessment of the Base Plan. This vulnerability assessment analyzes the population, property, and other assets (e.g. critical facilities, historic assets) at risk to hazards ranked of medium or high significance, or that may vary from other parts of the planning area.

The key information to support the Hazard Identification and Risk Assessment (HIRA) for this Annex was collected through a Data Collection Guide document, which was distributed to each participating municipality, community services district, or special district to complete during the planning process. Information was collected for the Oceano CSD as well as the cities of Arroyo Grande and Grover Beach, and was analyzed and summarized to identify and rank all the hazards that could impact anywhere within the County, as well as to rank the hazards and identify the related vulnerabilities unique to this District. In addition, the Sanitation District planning team was asked to share information on past hazard events that have affected the District.





Each participating jurisdiction or district was in support of the main hazard summary identified in the Base Plan (See subsection 5.1). However, the hazard summary rankings for each jurisdictional annex may vary slightly due to specific hazard risk and vulnerabilities unique to that jurisdiction. Identifying these differences helps the reader to differentiate the Sanitation District's risk and vulnerabilities from that of the overall County.

The hazard summaries in Table T.3 reflect the hazards that could potentially affect the District in major ways. Based on this analysis, the priority hazard (High Significance) for mitigation is Earthquake/Liquefaction. The second priority hazards (Medium Significance) are Agricultural Pest Infestation/Disease, Dam Incidents/Failure, and Flood. The discussion of vulnerability for each of the assessed hazards is contained in the following sections. Those of Medium or High significance for the Sanitation District are identified below.

- Agricultural Pest Infestation/Disease
- Coastal Flood/Coastal Erosion/Sea Level Rise
- Dam Incidents/Failure
- Earthquake/Liquefaction
- Flood

Other Hazards

Hazards assigned a significance rating of Low or Not Applicable may not be assessed within this annex. The hazards to the planning area which were rated by the Planning Committee are summarized under subsection T.2 herein (Hazard Identification and Summary). The majority were given minimum priority due to a lack of exposure, vulnerability, and/or no probability of occurrence or previous history or losses, though some may contain a loss estimate discussion and further information, based again on potential risk to the District, under Section 5 of the Base Plan.

T.3.1 Assets at Risk

This section considers the District's assets at risk, including values at risk, critical facilities and infrastructure, historic assets, economic assets, and growth and development trends.

Values at Risk

The following data on property exposure is derived from San Luis Obispo County Assessor's data. This data should only be used as a guideline to overall values in the Sanitation District (which is again composed of the Cities of Arroyo Grande and Grover Beach as well as the Oceano CSD), given the information has some limitations. Table T.4 shows the exposure of properties (e.g., the values at risk based on improvement and content values only) broken down by property type for the South SLO County Sanitation District. Refer to the Base Plan subsection 5.2 (HIRA Asset Summary) for more details on value information, content calculations, and overall parcel analysis methodology.

Table T.4 Property Exposure Values for the Sanitation District by Parcel Type

Property Type	Parcel Count	Improved Value	Content Value	Total Value
Agricultural	11	\$968,849	\$968,849	\$1,937,698
Commercial	615	\$258,747,007	\$258,747,007	\$517,494,014
Government/ Utilities	159	\$89,487	--	\$89,487
Other/Exempt/Misc.	430	\$95,164,067	--	\$95,164,067
Residential	9,574	\$1,839,157,626	\$919,578,813	\$2,758,736,439
Multi-Family Residential	1,480	\$311,791,472	\$155,895,736	\$467,687,208
Mobile/Manufactured Homes	69	\$19,177,930	\$9,588,965	\$28,766,895





Property Type	Parcel Count	Improved Value	Content Value	Total Value
Residential: Other	1,161	\$252,818,098	\$126,409,049	\$379,227,147
Industrial	32	\$12,647,758	\$18,971,637	\$31,619,395
Vacant	69	\$16,911,610	--	\$16,911,610
TOTAL	13,600	\$2,807,473,904	\$1,490,160,056	\$4,297,633,960

Source: San Luis Obispo County 2019 Assessor data; ParcelQuest; Wood Plc analysis

Note: these values contain a combination of properties found within the Cities of Arroyo Grande and Grover Beach, and the Oceano CSD. Refer to the respective annexes and Base Plan documents for additional information.

Critical Facilities and Infrastructure

A critical facility is one that is essential to providing utility or direction either during the response to an emergency or during the recovery operation. See Section 5 of the Base Plan for more details on the definitions and categories of critical facilities.

An inventory of critical facilities in the Sanitation District based on San Luis Obispo County GIS data as well as structures obtained from the Homeland Infrastructure Foundation-Level Dataset (HIFLD) is provided in Table T.5 and Table T.6, as well as illustrated in Figure T.2. The four types of Critical Facilities categorized by San Luis Obispo County and its jurisdictions' and Districts' planning teams are: Emergency Services, High Potential Loss Facilities, Lifeline Utility Systems, and Transportation Systems. Note that the Sanitation District has identified 49 critical facilities total, although there are no High Potential Loss Facilities within the District's boundaries. In addition, 10 of the 49 total facilities in the Sanitation District are found within the Oceano boundaries alone but are accounted for as part of the South SLO County District for reference; these Oceano facilities will be marked with asterisks (*) in Table T.6. Refer to subsection 5.2 of the Base Plan for more information on the Assets used throughout this annex and the county-wide analyses.

Table T.5 Summary of Sanitation District's Critical Facilities

Facility Category	Facility Type	Count
Emergency Services	Day Care Facilities	14
	Emergency Medical Service Stations	4
	Fire Stations	3
	Hospitals	2
	Local Law Enforcement	3
	Nursing Homes	2
	Private Schools	5
	Public Schools	9
	Urgent Care	1
Lifeline Utility Systems	FM Transmission Towers	1
	Microwave Service Towers	1
	Paging Transmission Towers	1
	Wastewater Treatment Plants	1
	Water Treatment Facilities	1
Transportation Systems	Airports	1
TOTAL		49

Source: San Luis Obispo County Planning and Building; LAFCO; HIFLD; Wood Plc analysis




Table T.6 Details about Sanitation District's Critical Facilities

Facility Type	Name
Airport	Oceano County Airport
Day Care Facilities	Arroyo Grande Montessori School
	Arroyo Grande United Methodist Children's Center
	California State Preschool at Grover Beach
	Capslo - Oceano Migrant Children's Center
	Capslo - Five Cities Head Start
	Child's Smile Day Care
	Dandy Lion Montessori School
	Oceano First 5
	Open Door Pre-School
	Peace Christian Preschool
	St Patrick's Mercy Preschool
	Valley View Children's Center
	Village Preschool
	YMCA South County Preschool
Emergency Medical Service Stations	Arroyo Grande Fire Department
	Grover Beach Fire Department
	Oceano Community Services District
	San Luis Ambulance Service - Arroyo Grande
Fire Stations	Arroyo Grande Fire Department
	Grover Beach Fire Department
	Oceano Community Services District
FM Transmission Towers	--
Hospitals	Arroyo Grande Community Hospital
	Marian Regional Medical Center, Arroyo Grande
Local Law Enforcement	Arroyo Grande Police Department
	Grover Beach Police Department
	San Luis Obispo County Sheriff's Department - South Station
Microwave Service Towers	--
Nursing Homes	Alder House
	Wyndham Residence
Paging Transmission Towers	--
Private Schools	Arroyo Grande Montessori School
	Coastal Christian School
	Dandy Lion Montessori School
	St. Patrick's Catholic School
	Valley View Adventist Academy
Public Schools	Arroyo Grande High
	Fairgrove Elementary
	Grover Beach Elementary
	Grover Heights Elementary
	Harloe Elementary
	Ocean View Elementary
	Oceano Elementary





Facility Type	Name
	Paulding Middle
	Santa Lucia ROP
Urgent Care	Doctors Office - Urgent Care
Water Treatment Facilities	Central Coast Water Treatment
Wastewater Treatment Plant	South San Luis Obispo Sd Wastewater Treatment Plant

Source: San Luis Obispo County Planning and Building; LAFCO; HIFLD

Critical Processes at Wastewater Treatment Plant

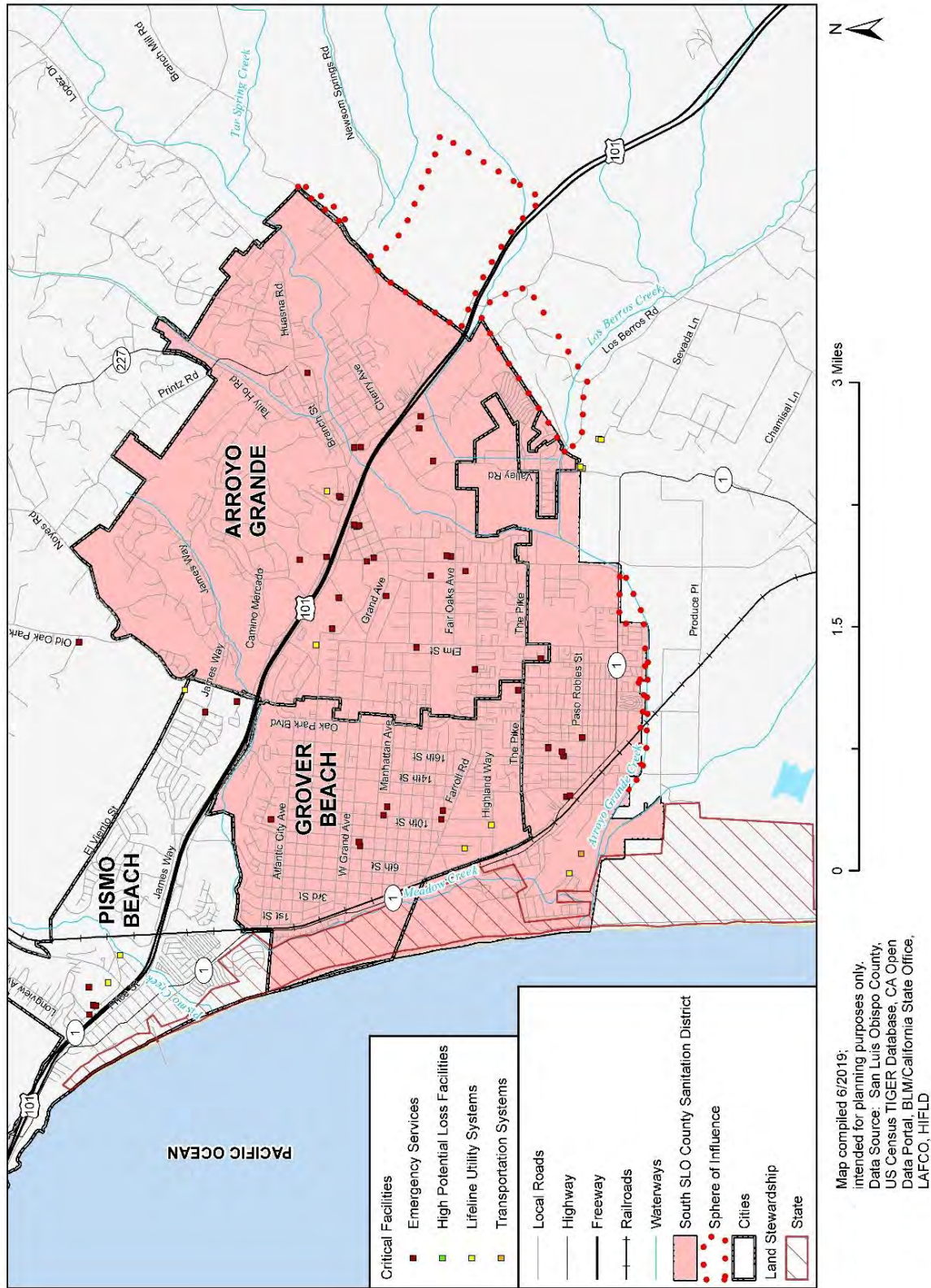
Additional Essential Infrastructures to the District noted by the Planning Team are noted below and fall under the Lifeline Utility System category:

- Headworks
- Main Control Center
- Primary Clarifiers (2)
- Fixed Film Reactor
- Secondary Clarifier
- Chlorine Contact Tank
- Emergency Generator





Figure T.2 Critical Facilities in the Sanitation District





Emergency Service Facilities

The Sanitation District contains 43 Emergency Services facilities aimed at providing for the health and welfare of the entire community. These include day care facilities, emergency medical service stations, fire stations, hospitals/urgent care facilities, local law enforcement, nursing homes, and schools as noted in Table T.5.

Transportation Systems and High Potential Loss Facilities

One critical transportation facility is present within the boundaries of the Sanitation District. This is the Oceano County Airport located within the Oceano CSD.

No high potential loss facilities such as power plants were identified by the County, HIFLD dataset, or the Planning Team.

Lifeline Utility Systems

A potential of five lifeline facilities have been identified for the South SLO County Sanitation District. These are noted in Table T.5 and Table T.6. Other facilities or structures falling within the lifeline utility systems category may be present in or nearby the District (e.g. oil/gas, electric power, communication systems), but those were not found to serve a critical purpose or function to the Sanitation District.

Historic and Cultural Resources

Historical assets include local, county, state, and potentially federally listed historic sites. Based on data provided by the County of San Luis Obispo and LAFCO, it was found that there are three historic and cultural resources in the Sanitation District boundaries. These are summarized in Table T.7 below.

Table T.7 Sanitation District's Historic and Cultural Resources

Area Plan Where Noted	Property Name	Year	Description	At Risk of These Hazards
San Luis Bay Area Plan – Inland	South Pacific Railroad Depot	--	South Pacific Railroad Depot	Dam inundation (by Lopez Dam); Moderate liquefaction risk; Tsunami inundation
	Temple of the People, Halcyon	1903	Built by a utopian religious group	Dam inundation (by Lopez Dam); Moderate liquefaction risk
San Luis Bay Area Plan - Coastal	Coffee T. Rice House	1886	--	Dam inundation (by Lopez Dam); Moderate liquefaction risk

Source: San Luis Obispo County Planning and Building; LAFCO

Natural Resources

Natural assets may include wetlands, threatened and endangered species, or other environmentally sensitive areas. Natural and environmental resources are important to include in benefit-cost analyses for future projects and may be used to leverage additional funding for projects that also contribute to community goals for protecting sensitive natural resources. Awareness of natural assets can lead to opportunities for meeting multiple objectives. For instance, protecting wetlands areas protects sensitive habitat as well as attenuates and stores floodwaters. Because the Sanitation District encompasses the Cities of Arroyo Grande and Grover Beach as well as the Oceano CSD, referring to these respective annexes as well as the documents within the Base Plan is recommended to get more details on natural resources of interest within this special district.





Economic Assets

Because the Sanitation District encompasses the Cities of Arroyo Grande and Grover Beach as well as the Oceano CSD, referring to these respective annexes as well as the documents within the Base Plan is recommended to get more details on economic assets within this special district. However, below is some key information about the economic assets in these three Sanitation District member communities:

- Grover Beach has recently experienced growth in Wholesale Trade and the Manufacturing sectors; some amount of land is available in the business park area of the city for business expansion and relocation. Because of this, certain hazards such as those affecting the landscape (e.g. earthquake, liquefaction) could be important if choosing to develop in these available areas.
- Arroyo Grande contains two of the largest employers in the County, such as the Arroyo Grande Community Hospital which employs over 400 people. This facility is located within a dam inundation zone, which could have devastating impacts on the local economy due to financial losses as well as affect the community's ability to respond to and recover from potential dam failure events.
- The Oceano CSD's top two industries are retail trade and agriculture/forestry/fishing/hunting. A natural disaster that affected these and forced shops or commercial spaces to close would have significant impacts on the local economy, as would events such as severe weather, flooding, or earthquakes on the agricultural and tourism industries.

T.3.2 Estimating Potential Losses

This section details vulnerability to specific hazards of medium or high significance, where quantifiable, noted by the Planning Team. Impacts of past events and vulnerability to specific hazards are further discussed below, though Section 5 of the Base Plan should be referenced for more details on the County's HIRA findings and hazard profiles.

Agricultural Pest Infestation and Disease

Due to Arroyo Grande, Grover Beach, and Oceano CSD containing relatively large amounts of agricultural fields, this hazard was ranked as a **Medium Significance** hazard in the District. Pests and related diseases/pathogens have the potential to affect the local economy and agricultural landscapes by hurting or destroying crops and livestock. The number of invasive pests and pathogens newly detected in California and the rest of the United States has increased at alarming rates in recent years, and that trend is projected to continue into the future. A specific concern of the County is tree vulnerability and mortality. Over 100 million trees have died and more continue to die due to many years of drought that have weakened trees, and left millions of acres of forestland highly susceptible to insect attacks. The drought stress is exacerbated in forests with too many trees competing for limited resources, especially water. Forest pests (insects and diseases) annually destroy ten times the volume of timber lost to due to forest fires. For more information and details on this hazard and its effects on the county and the communities refer to subsection 5.3.5 Agricultural Pest and Disease.

Dam Incidents and Failure

The Sanitation District is at risk of dam failure incidents based on its location downstream of the Lopez Dam. The Lopez Dam is a high hazard earthen dam located just southwest of the Lopez Lake, about eight miles northeast of Arroyo Grande. If this dam were to fail and flood through the Arroyo Grande River into the Sanitation District or any of its three-member communities, major damages could be expected; it could inundation more than half of Grover Beach and Arroyo Grande, as well as the vast majority of the Oceano CSD. Refer to the Arroyo Grande, Grover Beach, and Oceano Annexes in this Plan. Table T.8 summarizes the critical facilities that fall within the Lopez Dam's inundation extents as determined by the GIS overlay analysis.



**Table T.8 Critical Facilities in the Sanitation District within the Lopez Dam Inundation Extents**

Critical Facility Type	Facility Total
Day Care Facilities	9
Emergency Medical Service Stations	2
Fire Stations	2
Hospitals	2
Local Law Enforcement	1
Microwave Service Stations	2
Nursing Homes	2
Private Schools	2
Public Schools	6
Wastewater Treatment Plants	1
Water Treatment Facilities	1
Airports	1
TOTAL	31

Source: San Luis Obispo County Planning and Building Dept., HIFLD, Wood Plc Analysis

A failure of the Lopez Dam would also affect Highway 101 and other important local roads, hence impeding or reducing flows of goods, people, and resources into and out of the cities and CSD, potentially impacting the entire region. Refer to subsection 5.3.8 Dam Incidents for more details on the hazard and the analysis performed at the County level. This hazard holds **Medium Significance** for the Sanitation District.

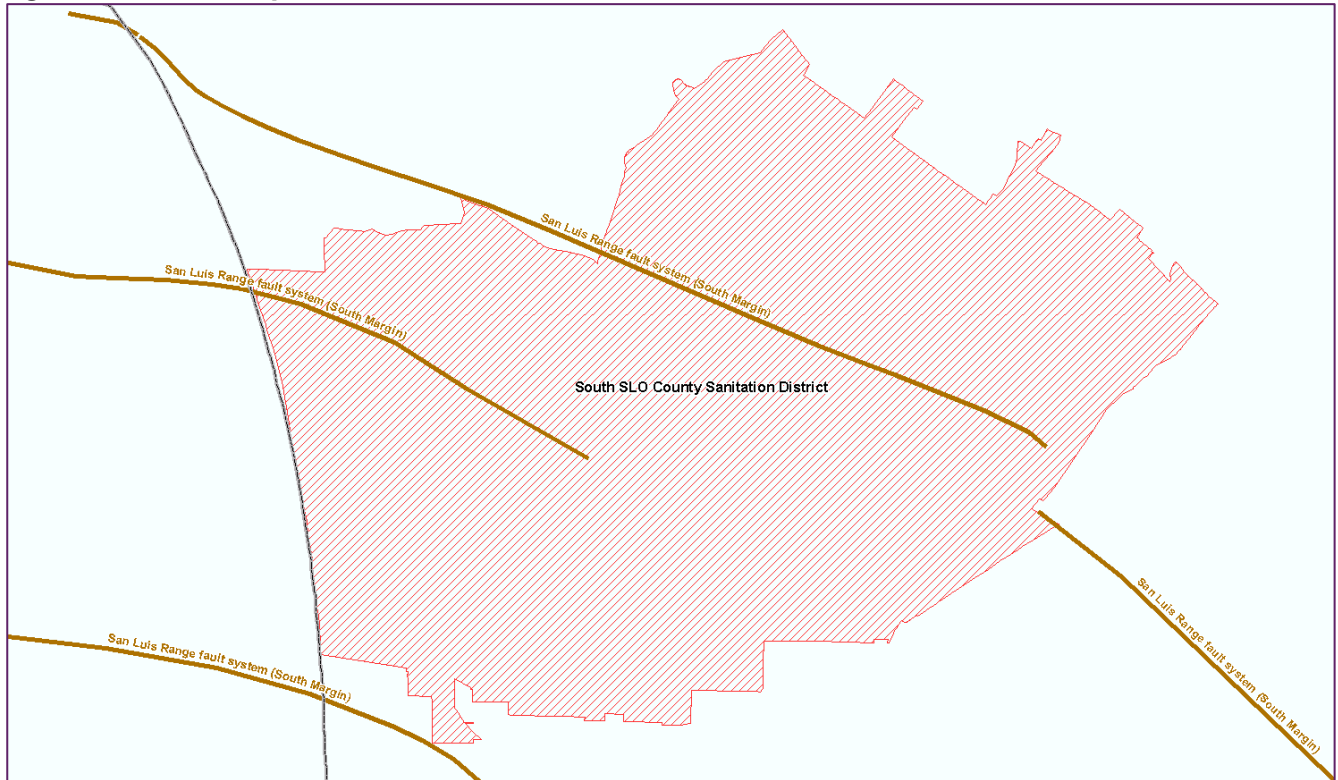
Earthquake and Liquefaction

The Sanitation District is underlaid by several earthquake faults such as those part of the San Luis Range/South Margin fault system. (See a very basic layout of the District and surrounding faults in Figure T-3). The seismic hazards of earthquake coupled with liquefaction (both of which are discussed in more detail in subsection 5.3.10 of the Base Plan) are ranked as **High Significance** hazards due to the large degree of liquefiable soil risk in the Grover Beach, Arroyo Grande, and Oceano communities (see each respective City or CSD Annex for more information).





Figure T.3 Earthquake Faults near the Sanitation District



Source: USGS; San Luis Obispo County Planning and Building; LAFCO

Many people and properties would be expected to be affected by a moderate or major seismic event in the area, as noted in the Base Plan and three community Annexes. Additionally, 44 of the Sanitation District's 49 critical facilities are located within moderately liquefiable soils (based on GIS analysis). Table T.9 summarizes these facilities based on type and count.



**Table T.9 Critical Facilities in Moderate Liquefaction Risk Areas in the Sanitation District**

Critical Facility Type	Facility Total
Day Care Facilities	12
Emergency Medical Service Stations	4
Fire Stations	3
Hospitals	2
Local Law Enforcement	3
Microwave Service Stations	2
Nursing Homes	2
Private Schools	3
Public Schools	8
Wastewater Treatment Plants	1
Water Treatment Facilities	1
Airports	1
Paging Transmission Towers	1
Urgent Care	1
TOTAL	44

Source: San Luis Obispo County Planning and Building Dept., HIFLD, Wood Plc Analysis

Flood

The Sanitation District is at risk of riverine flooding based on FEMA data last updated for San Luis Obispo County in February of 2019. Per the maps and analysis available in subsection 5.3.11 of the Base Plan, as well as the Arroyo Grande, Grover Beach, and Oceano CSD Annexes, major sources of flooding in the District include the 100- and 500-year flood events as well as coastal flooding. These major sources of flooding are summarized in the bullet list below based on the three member communities. The main areas that would experience major flooding are the Oceano CSD (on the west, south, and east), the west and north of Grover Beach, and the northwest, south, central-east, and north/northeast of Arroyo Grande. Based on the information summarized in this section as well as the Planning Team's recommendations, flood is ranked as a **Medium Significance** hazard for the Sanitation District.

The Sanitation District is not required to participate separately in the National Flood Insurance Program (NFIP) but will continue to support the County's participation in and compliance with the NFIP.

Major Sources of Flooding in the District:

- Arroyo Grande Creek
- Pismo Creek
- Tar Spring Creek
- Meadow Creek
- Los Berros Creek
- Smaller tributaries of the five waterways named above
- Coastal flooding (of type VE based on FEMA flood zone designations) on the beach front

Flood Control Zones

The San Luis Obispo County Flood Control and Water Conservation District was founded in 1945, and this entity provides general funding to help communities identify flooding problems, recommend solutions, and help





implement projects while establishing zones to benefit the funding of specific mitigation projects. The following two zones encompass portions of the Sanitation District:

- Zone 1: Arroyo Grande Creek Channel/Zone 1A – Los Berros Diversion Channel of Arroyo Grande Creek
- Zone 3: Arroyo Grande Creek

Refer to subsection 5.3.11 of the Base Plan for more details on these flood control zones as well as past or ongoing projects that affect or relate to this Sanitation District.

Levees

There is one levee system that provides flood protection and hence reduces the risk to people and structures in the Sanitation District, per the San Luis Obispo County Dam and Levee Failure Evacuation Plan completed in 2016. The Arroyo Grande Creek Levee System is especially vulnerable to flooding, and severe riverine-based inundation occurred from the Arroyo Grande Creek back in the 1950s, causing damages on farmlands and nearby infrastructure. The Arroyo Grande Creek Flood Control Project was established as a result of these flooding events to confine the Arroyo Grande Creek from its confluence with Los Berros Creek downstream. While this levee confines water and potential losses just south of the Oceano CSD, south and east of the Oceano Airport (refer to Figure 5-4 Arroyo Grande Levee System of the subsection 5.3.11 in the Base Plan), future potential damages or losses could be greatly avoided to the Sanitation District's members, particularly between Highway 1 and the 22nd Street bridges, thanks to this levee system.

A main failure of this levee system was noted in March of 2001 when a heavy rain event caused breaching on the south side of the levee, between the Arroyo Grande Creek and the Union Pacific railroad bridge. Hundreds of acres of farmland, as well as residences and properties, were flooded and damaged.

Critical Facilities at Risk

Based on GIS overlay analysis of the Sanitation District's boundaries with the FEMA flood hazard areas, a total of five critical facilities were found to overlap with the District's floodplains. Two are located in the Oceano CSD, while three are in parts of Arroyo Grande or Grover Beach. Table T.10 below summarizes these facilities.

Table T.10 Critical Facilities in FEMA Flood Hazard Areas in the Sanitation District

Critical Facility Type	Name	Flood Event	Total Facilities
Day Care Facilities	YMCA South County Preschool	500-Year	5
Public Schools	Arroyo Grande High School		
	Santa Lucia ROP		
Airports	Oceano County Airport	100-Year	
Wastewater Treatment Plants	South San Luis Obispo SD Wastewater Treatment Plant		

Source: San Luis Obispo County Planning and Building Dept., HIFLD, FEMA NFHL, Wood Plc Analysis

Coastal Storm/Coastal Erosion/Sea Level Rise

As part of the 2019 HMP planning effort, a sea level rise risk assessment was completed to determine how sea level rise may affect coastal jurisdictions and critical facilities and how coastal flooding might be exacerbated in the future. The only critical facility that would be affected by sea level rise is the wastewater treatment plan, and there is no risk until the 300 cm scenario. Table T.11 and Table T.12 summarize the other properties at risk of inundation by sea level rise and sea level rise combined with a 1% annual chance coastal flood. The area of inundation by sea level rise and sea level rise combined with the 1% coastal flood are shown in Figure T.4 and





Figure T.5, respectively. See subsection 5.3.7 Coastal Storm/Coastal Erosion/Sea Level Rise in the base plan for more details on the scenarios and data sources used for this analysis.

Table T.11 Properties Inundated by Sea Level Rise and Sea Level Rise with 1% Annual Chance Flood

Property Type	25-cm SLR	75-cm SLR	300-cm SLR	25-cm SLR w/ 1% Flood	75-cm SLR w/ 1% Flood	300-cm SLR w/ 1% Flood
Agricultural	--	--	1	--	--	1
Commercial	--	--	15	--	--	19
Government/Utilities	--	--	13	--	--	16
Other/Exempt/Misc.	--	--	21	--	--	29
Residential	--	--	147	--	--	177
Multi-Family Residential	--	--	74	--	--	85
Mobile/Manufactured Homes	--	--	1	--	--	2
Residential: Other	--	--	20	--	--	24
Industrial	--	--	1	--	--	3
Vacant	--	--	2	--	--	2
Total	--	--	295	--	--	358

Source: Wood analysis with USGS CoSMoS 3.1 data

Table T.12 Improved Values of Properties Inundated by Sea Level Rise and Sea Level Rise with 1% Annual Chance Flood*

Property Type	25-cm SLR	75-cm SLR	300-cm SLR	25-cm SLR w/ 1% Flood	75-cm SLR w/ 1% Flood	300-cm SLR w/ 1% Flood
Agricultural	--	--	\$165,701	--	--	\$165,701
Commercial	--	--	\$2,392,580	--	--	\$2,929,341
Government/Utilities**	--	--	\$0	--	--	\$0
Other/Exempt/Misc.**	--	--	\$6,073,385	--	--	\$6,928,953
Residential	--	--	\$23,571,351	--	--	\$28,460,496
Multi-Family Residential	--	--	\$7,721,566	--	--	\$12,459,912
Mobile/Manufactured Homes	--	--	\$281,303	--	--	\$586,646
Residential: Other	--	--	\$2,792,785	--	--	\$4,238,793
Industrial	--	--	\$62,392	--	--	\$107,956
Vacant	--	--	\$242,315	--	--	\$242,315
Total	\$0	\$0	\$43,303,378	\$0	\$0	\$56,120,113

*South SLO Sanitation District encompasses the Cities of Grover Beach and Arroyo Grande as well as the majority of the Oceano CSD. As such, the totals for the Sanitation District may be duplicative when compared to the other cities' and the CSD's totals.

**Values may be underestimated as some values not available in parcel data due to being exempt from tax assessment; Port San Luis values represent pier valuations provided by the District.

Source: Wood analysis with USGS CoSMoS 3.1 data





Figure T.4 South SLO Sanitation District Sea Level Rise Scenario Analysis: Tidal Inundation Only

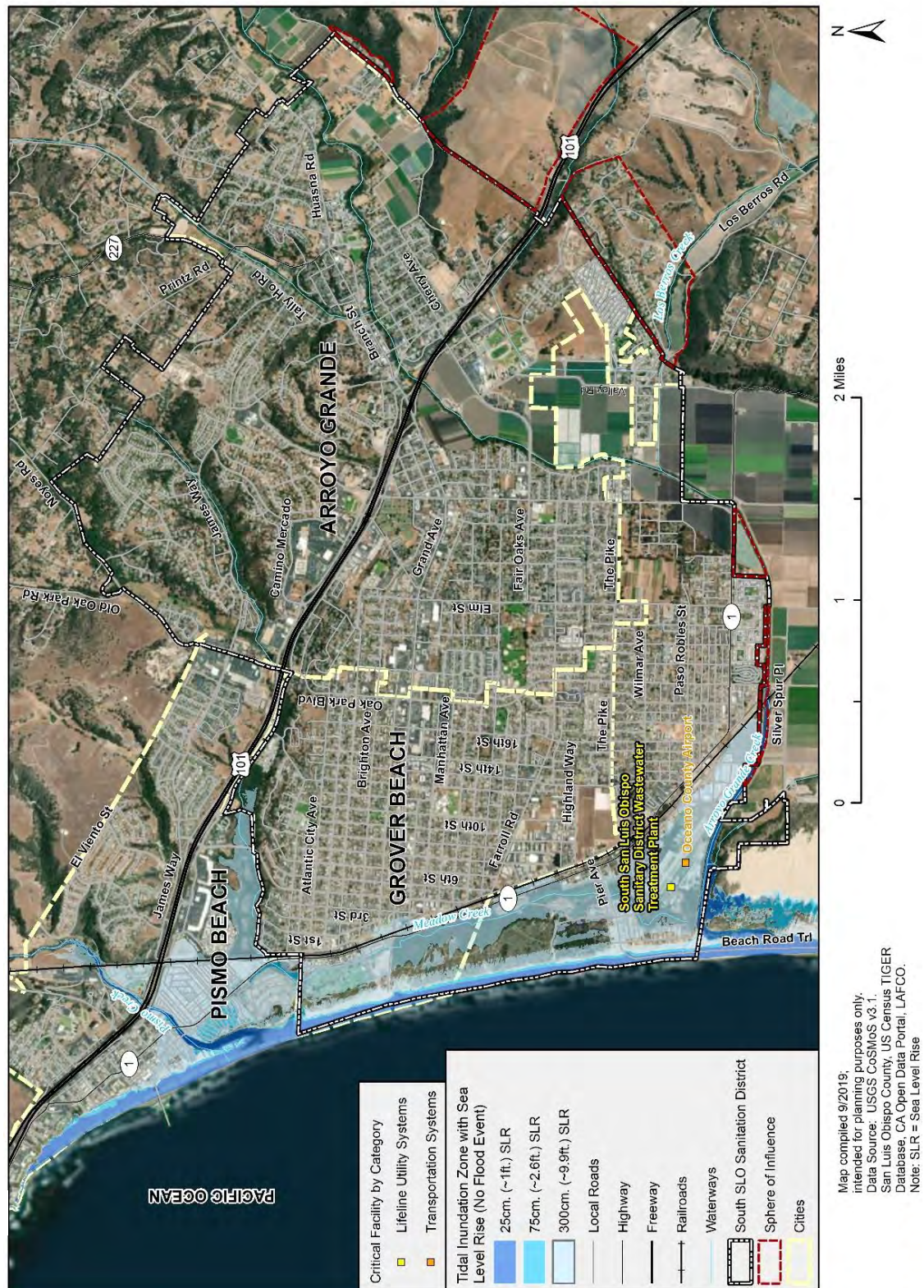




Figure T.5 South SLO Sea Level Rise Scenario Analysis: Tidal Inundation and 1% Annual Chance Flood





T.4 Capability Assessment

Capabilities are the programs and policies currently in use to reduce hazard impacts, or that could be used to implement hazard mitigation activities. This capability assessment is divided into five sections: regulatory mitigation capabilities, administrative and technical mitigation capabilities, fiscal mitigation capabilities, mitigation outreach and partnerships, and other mitigation efforts.

To develop this capability assessment, the jurisdictional and District planning representatives used a matrix of common mitigation activities to inventory policies or programs in place. The team then supplemented this inventory by reviewing additional existing policies, regulations, plans, and programs to determine if they contributed to reducing hazard-related losses.

During the plan update process, this inventory was reviewed by the jurisdictional and district planning representatives and Wood consultant team staff to update information where applicable and note ways in which these capabilities have improved or expanded. In summarizing current capabilities and identifying gaps, the jurisdictional planning representatives also considered their ability to expand or improve upon existing policies and programs as potential new mitigation strategies. The Sanitation District capabilities are summarized below.

T.4.1 Regulatory Mitigation Capabilities

Table T.11 identifies existing regulatory capabilities the District has in place to help with future mitigation efforts. Note: many of the regulatory capabilities that can be used for the District are within the County's jurisdiction. Refer to the Base Plan's Section 6 Capability Assessment for specific information related to the County's mitigation capabilities as well as more details on this topic.

Table T.13 Sanitation District Regulatory Mitigation Capabilities

Regulatory Tool	Yes/No	Comments
General plan	No	
Zoning ordinance	No	
Subdivision ordinance	No	
Growth management ordinance	No	
Floodplain ordinance	No	
Other special purpose ordinance (stormwater, water conservation, wildfire)	Yes	Sanitary Sewer System Use Ordinance 2011-1 and Pretreatment Ordinance 1994-1
Building code	No	
Fire department ISO rating	No	
Erosion or sediment control program	No	
Stormwater management program	No	
Site plan review requirements	No	
Capital improvements plan	No	
Economic development plan	No	
Local emergency operations plan	No	
Other special plans	No	
Flood Insurance Study or other engineering study for streams	No	
Elevation certificates (for floodplain development)	No	

Source: Wood Data Collection Guide, 2019; Sanitation District





T.4.2 Administrative/Technical Mitigation Capabilities

Table T.12 identifies the personnel responsible for activities related to mitigation and loss prevention in the South SLO County Sanitation District.

Table T.14 Sanitation District Administrative/Technical Mitigation Capabilities

Personnel Resources	Yes/No	Department/Position/Comments
Planner/engineer with knowledge of land development/land management practices	Yes	District Administrator
Engineer/professional trained in construction practices related to buildings and/or infrastructure	Yes	District Administrator
Planner/engineer/scientist with an understanding of natural hazards	Yes	District Administrator
Personnel skilled in GIS	Yes	Operators
Full time building official	No	
Floodplain manager	No	
Emergency manager	No	
Grant writer	No	
Other personnel	Yes	District Administrator (Professional Engineer), Certified Wastewater Treatment Plant Operators, ELAP Certified Laboratory Technician, Secretary/Bookkeeper
GIS Data Resources (Hazard areas, critical facilities, land use, building footprints, etc.)	Yes	Arc GIS of Trunk Sewer Line
Warning systems/services (Reverse 9-11, outdoor warning signals)	No	

Source: Wood Data Collection Guide, 2019; Sanitation District

T.4.3 Fiscal Mitigation Capabilities

Table T.13 identifies financial tools or resources that the District could potentially use to help fund mitigation activities.

Table T.15 Sanitation District Fiscal Mitigation Capabilities

Financial Resources	Accessible/Eligible to Use (Yes/No)
Community Development Block Grants	No
Capital improvements project funding	Yes
Authority to levy taxes for specific purposes	No
Fees for water, sewer, gas, or electric services	Yes
Impact fees for new development	No
Incur debt through general obligation bonds	Yes
Incur debt through special tax bonds	No
Incur debt through private activities	No
Withhold spending in hazard prone areas	No



T.4.4 Mitigation Outreach and Partnerships

The South SLO County Sanitation District runs a responsible water use outreach program to encourage conservation and efficiency by sending out public notices via quarterly newsletters, school outreach efforts, and bill stuffers for water conservation, responsible water use, and sewer misuse examples. Other outreach, partnership, and general District efforts include those stated in existing planning mechanisms such as the Local Hazard Mitigation Plan shared by the participating jurisdictions (Arroyo Grande and Grover Beach) and the special district (Oceano), last updated in 2015.

T.4.5 Other Mitigation Efforts

The following mitigation projects were noted by the Planning Team as being completed since the 2015 plan.

- Completed August 2016: Sea Level Rise Analysis. To assess the existing and future flood exposure of the wastewater treatment facility, including estimates of the flood elevations and frequencies, which will be used to inform the environmental review, permitting, and design of the District's Redundancy Project.
- Completed December 2018: Coastal Hazards Monitoring Plan. Study to prepare a Coastal Hazards Monitoring Plan that can be implemented by the District to track how hazards change over time, and to document actions and responses for managing those hazards.
- Completed January 2019: SSLO Sanitation District Wastewater Treatment Plant Redundancy Project Geotechnical Report. This report provides geotechnical recommendations for the design of a new clarifier, aeration basin, blower building, equipment pads and associated piping. The proposed improvements if implemented according to the recommendations in the report will add redundancy to the existing wastewater treatment plant and add resiliency to the plan relative to flooding, seismic, and coastal hazards, notably soil liquefaction.

T.4.6 Opportunities for Enhancement

Based on this capability assessment and the noted information from existing plans and efforts (e.g., those noted in the District's Strategic Plan from 2018), the South SLO County Sanitation District has several existing mechanisms in place that help to mitigate hazards. There are also opportunities for the District to expand or improve on these policies and programs to further protect the community. Future improvements may include: providing training for staff members related to hazards or hazard mitigation grant funding in partnership with the County and Cal OES; or obtaining official certification such as Storm Ready or FireWise certifications. Additional training opportunities will help to inform District staff and board members on how best to integrate hazard information and mitigation projects into the District policies and ongoing duties of the District. Continuing to train District staff on mitigation and the hazards that pose a risk to the South SLO County Sanitation District will lead to more informed staff members who can better communicate this information to the public and prevent or respond to changes in development and the District makeup overall. Furthermore, the Planning Team for the District noted that South SLO Sanitation District often seeks to find opportunities to reinforce and strengthen its infrastructure during the initial design of facilities planned to be built. The District has developed a robust Coastal Hazards Monitoring Plan. A review process that involves assessing existing facilities against hazards to determine their vulnerability has not been fully cataloged, so the District hopes to continue these ongoing efforts in the future.

T.5 Mitigation Strategy

T.5.1 Mitigation Goals and Objectives

The Sanitation District adopts those hazard mitigation goals and objectives developed by the County Planning Team and described in Section 7 of the Base Plan: Mitigation Strategy.





T.5.2 Completed 2015 Mitigation Actions

The South SLO County Sanitation District has completed two mitigation actions identified in the 2015 plan. These completed actions have reduced vulnerability to hazards and increased local capability to implement additional mitigation actions. The following are the completed mitigation actions:

- SD.3 Sea Level Rise Analysis. To assess the existing and future flood exposure of the wastewater treatment facility, including estimates of the flood elevations and frequencies, which will be used to inform the environmental review, permitting, and design of the District's Redundancy Project.
- SD.4 Coastal Hazards Monitoring Plan. Study to prepare a Coastal Hazards Monitoring Plan that can be implemented by the District to track how hazards change over time, and to document actions and responses for managing those hazards.

T.5.3 Mitigation Actions

The Planning Team for the South SLO County Sanitation District identified and prioritized the following mitigation actions based on the conducted risk assessment (see Table T.1). Actions were prioritized using the process described in subsection 7.2.1 of the Base Plan. Background information and information on how each action will be implemented and administered, such as ideas for implementation, responsible office, potential funding, estimated cost, and timeline are also included. Actions with an asterisk (*) are those that mitigate losses to future development.



**Table T.14 South SLO County Sanitation District's Mitigation Action Plan**

ID	Hazard(s) Mitigated	Description/Background/Benefits	Lead Agency and Partners	Cost Estimate	Potential Funding	Priority	Timeline	Status/ Implementation Notes
SD.1	Coastal Flood/ Coastal Erosion/ Sea Level Rise	Coastal Monitoring Program. Regularly monitoring flood and other coastal hazards at the site and management responses to those hazards both on and off site. Identifying how those hazards are impacting and affecting operations of the wastewater treatment plant. Identifying changes necessary to allow continued appropriate and required functioning of the plant. Identifying flood/hazard "triggers" to establish when actions (such as retrofits, upgrades, and including plant relocation) need to be pursued in response to specific flood/hazard events or flood management activities.	SSLOCSD	\$10,000 to \$50,000	SSLOCS/ FEMA HMA	High	Annual implementation	New. Benefits would include reduced coastal flooding impacts
SD.2	Flood; Coastal Flood/ Coastal Erosion/ Sea Level Rise; Earthquake, Dam incident	Redundancy Project - Flood Risk Mitigation Strategy. All critical new and existing facilities will be installed or upgraded to be protected from the 100-year flood event on Arroyo Grande Creek as defined by Flood Insurance Rate Map (FIRM) maps. This would also protect these facilities from floods caused by sea level rise for the design life of the facilities and provide additional protection from dam incident flooding.	SSLOCSD	\$10,000 to \$50,000	SSLOCS/ Redundancy Project	High	2-3 yrs.	New Benefits include Protection of critical structures, equipment, continued operations of the wastewater treatment plant during a 100-year flood event. Redundant facilities will also be designed according to current state seismic design standards.
SD.3	Earthquake	Wastewater Treatment Plant Redundancy Project – Implementation of liquefaction hazard mitigation measures per	SSLOCSD	\$10,000 to \$50,000	SSLOCSD/ Redundancy Project	High	More than 5 yrs.	New Benefits: Ability to conceptualize the



ID	Hazard(s) Mitigated	Description/Background/Benefits	Lead Agency and Partners	Cost Estimate	Potential Funding	Priority	Timeline	Status/ Implementation Notes
		the 2019 Redundancy Project Geotechnical Report during construction of additional treatment infrastructure.						cost of relocating the plant if necessary, in the future. (\$130,000,000 in 2016 dollars to relocate); relocation would incorporate current seismic design and provide added dam incident mitigation benefits.





T.6 Implementation and Maintenance

Moving forward, the South SLO County Sanitation District will use the mitigation action table in the previous section to track progress on implementation of each project. Implementation of the plan overall is discussed in Section 8 Implementation and Monitoring of the Base Plan.

T.6.1 Incorporation into Existing Planning Mechanisms

The information contained within this annex and the Base Plan, including results from the Vulnerability Assessments and the Mitigation Strategy, will be used by the District to help inform updates of the Sanitation District's existing plans (e.g. Strategic Plan) as well as in the development of additional local plans, programs, regulations, and policies. Understanding the hazards that pose a risk and the specific vulnerabilities to the District and its sphere of influence will help in future capital improvement planning and development for the District. The San Luis Obispo County Planning & Building Department may utilize the hazard information when reviewing a site plan or other type of development applications within or nearby the boundaries of the South SLO County Sanitation District area. As noted in Section 8 Implementation and Monitoring, the Planning Team representative/s from the South SLO County Sanitation District will report on efforts to integrate the hazard mitigation plan into local plans, programs, regulations, and policies and will report on these efforts at the annual Hazard Mitigation Plan and Planning Team review meeting.

T.6.2 Monitoring, Evaluation and Updating the Plan

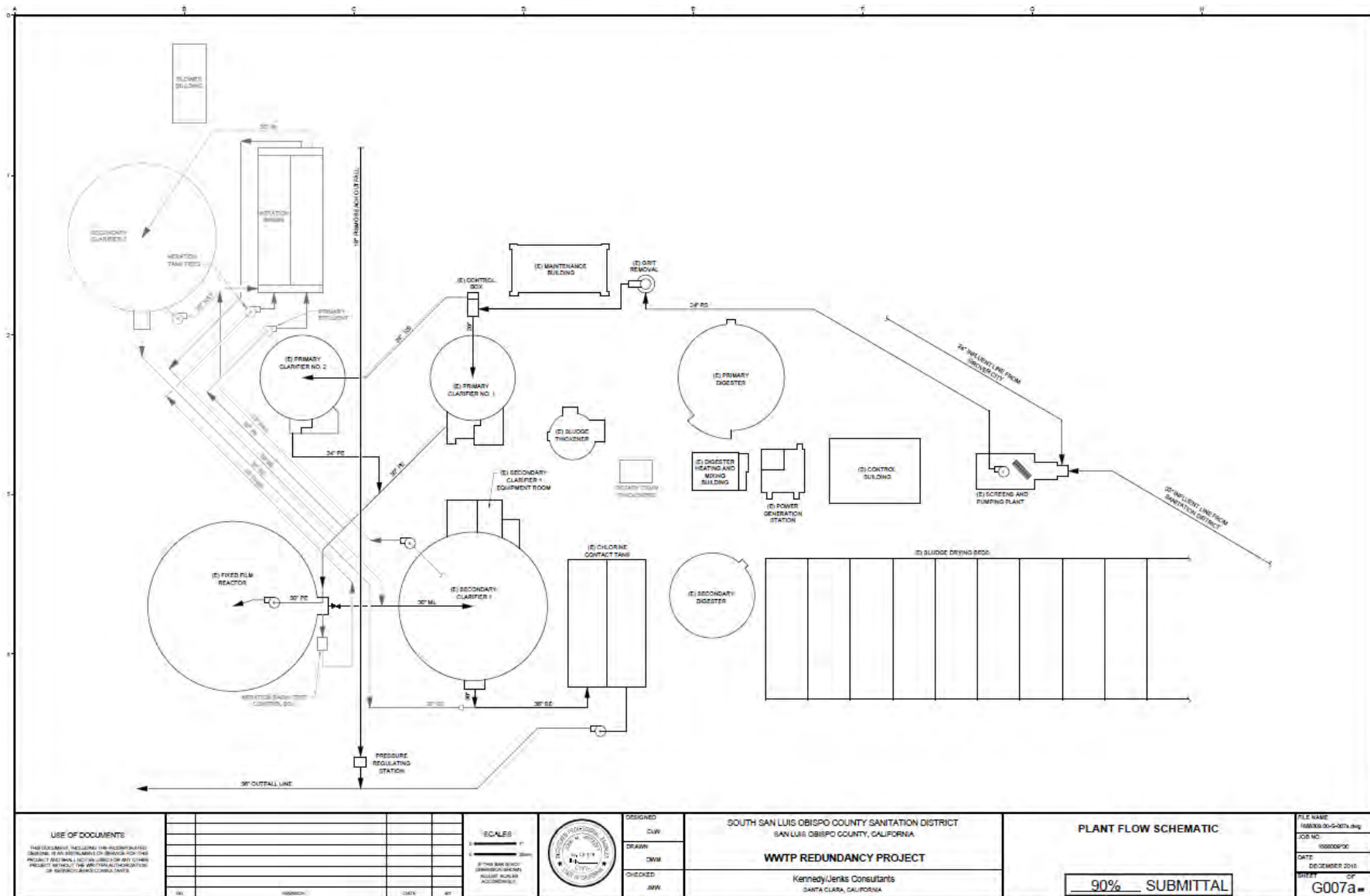
The South SLO County Sanitation District will follow the procedures to monitor, review, and update this plan in accordance with San Luis Obispo County as outlined in Section 8 of the Base Plan. The District will continue to involve the public in mitigation, as described in subsection 8.3 of the base plan. The CSD General Manager will be responsible for representing the Community Services District in related County Hazard Mitigation Plan meetings or events, and for coordination with County staff and departments during plan updates. The Sanitation District realizes it is important to review the plan regularly and update it every five years in accordance with the FEMA Disaster Mitigation Act Requirements as well as other State of California requirements.

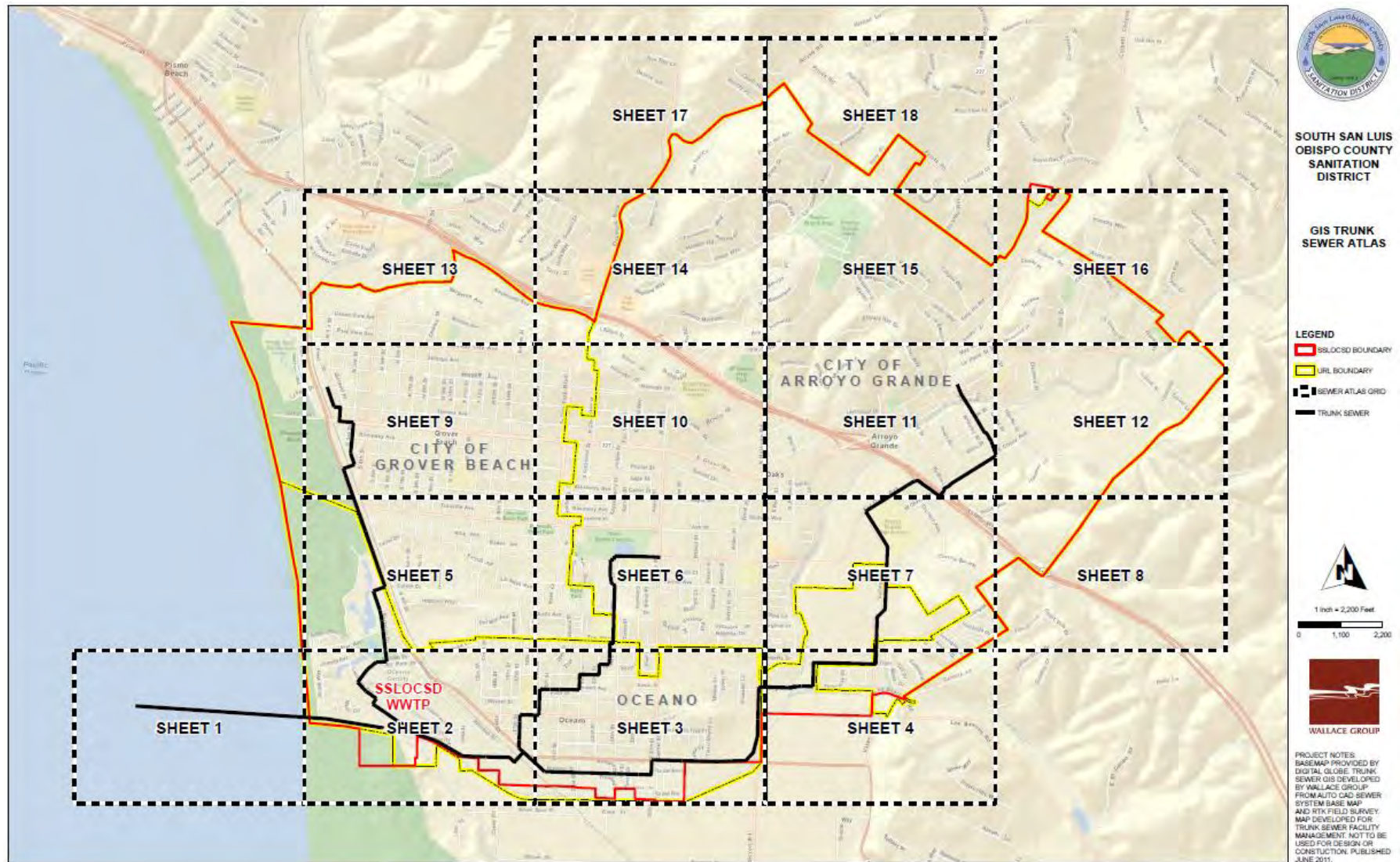




T.7 Attachments







APPENDIX A: HMPC MEMBERS

Agency/Jurisdiction	Title	Name	Participating Jurisdiction	Stakeholder	Meetings ¹ Attended
County Departments					
<i>Planning and Building - Long Range Planning Division</i>					
	Project Manager	Jillian Ferguson	X		Kick-off; Mtg #2;
	Senior Planner	Jay Johnson	X		Kick-off; Mtg #2
	Long Range Supervisor	Karen Nall	X		Kick-off; Mtg #2
	Planner	Kylie Hensley	X		Mtg #3; Mtg #4
	Planner	Kip Morais	X		Mtg #3; Mtg #4
	GIS Analyst	Rebecca Whiteside	X		Mtg #4
	GIS Analyst	Jeff Legato	X		Kick-off; Mtg #2; Mtg #4
<i>Office of Emergency Services</i>					
	Emergency Services Manager	Joe Guzzardi	X		Kick-off; Mtg #2
	Emergency Services Coordinator	Scott Milner	X		Kick-off; Mtg #2; Mtg #3; Mtg #4
<i>Public Works</i>					
	Deputy Director – Transportation/Development	Dave Flynn	X		
	Deputy Director – Resources	Kate Ballantyne	X		Kick-off; Mtg #2; Mtg #3
	Water Resources Engineer	Mladen Bandov	X		Kick-off; Mtg #3
<i>San Luis Obispo County Fire Department / Cal Fire– Fire Safe Council</i>					
	Manager	Dan Turner		X	Kick-off; Mtg #2
	Division Chief	Alan Peters	X		Mtg #3
<i>Agriculture</i>					
	Env. Resource Specialist	Lynda Auchinachie	X		Kick-off; Mtg #2
<i>Civic Spark</i>					
	Fellow	Bryan Iwamoto	X		Kick-off; Mtg #2; Mtg #3; Mtg #4
	Fellow	Francisco Pares	X		Kick-off; Mtg #2; Mtg #3; Mtg #4
<i>Municipalities</i>					
City of Arroyo Grande	Fire Chief, Five Cities Fire Authority	Stephen Lieberman	X		Kick-off; Mtg #3

¹ Those that are not listed as attending a meeting participated in the planning process in other ways such as emails, phone calls and face-to-face meetings with the County Project Manager and consultants.

Agency/Jurisdiction	Title	Name	Participating Jurisdiction	Stakeholder	Meetings ¹ Attended
City of Arroyo Grande	Program Analyst	Camilla Kavamanlis	X		Kick-off; Mtg #2; Mtg #3
City of Arroyo Grande	Planning Manager	Matt Downing	X		Mtg #3; Mtg #4
City of Atascadero	Fire Marshall	Tom Peterson	X		Kick-off; Mtg #2; Mtg #3; Mtg #4
City of Atascadero	Fire Chief	Casey Bryson	X		Mtg #2
City of Grover Beach	Chief of Police	John Peters	X		Mtg #2
City of Morro Bay	Fire Chief	Steve Knuckles	X		
City of Morro Bay	Fire Marshall	Matt Vierra	X		Kick-off; Mtg #3
City of Paso Robles	Fire Chief	Jonathan Stornetta	X		Kick-off; Mtg #2; Mtg #4
City of Pismo Beach	Associate Planner	Mike Gruver	X		
City of San Luis Obispo	Interim Fire Chief	Keith Aggson	X		Kick-off
City of San Luis Obispo	Fire Marshall	Rodger Maggio	X		Mtg #2; Mtg #3; Mtg #4
City of San Luis Obispo	Stormwater & Open Spaces	Bob Hill	X		Kick-off
City of San Luis Obispo	Sustainability Manager	Chris Read	X		Kick-off
City of San Luis Obispo	Administrative Analyst	James Blattler	X		Kick-off; Mtg #3; Mtg #4
SLO COG	Regional Transportation Planner	James Worthly		X	Mtg #2
Special Districts					
San Luis Obispo County Flood Control and Water Conservation District	Deputy Director – Resources	Kate Ballantyne	X		Kick-off
Cayucos Sanitary District	District Manager	Rick Koon	X		
South SLO County Sanitary District	Plant Supervisor	Mychal Jones	X		Mtg #4
Port San Luis Harbor District	Planner/Analyst	Chris Munson	X		Kick-off; Mtg #2; Mtg #3
Port San Luis Harbor District	Planner/Analyst	Kelly Shifflett	X		Kick-off
Community Service District					
Avila Beach	General Manager	Brad Hagermann	X		Kick-off
Cambria	Board Member	David Pierson		X	Mtg #2
Ground Squirrel Hollow	General Manager	Dan Gilmore	X		Kick-off; Mtg #3; Mtg #4
Heritage Ranch	General Manager	Scott Duffield	X		Kick-off; Mtg #2; Mtg #3; Mtg #4

Agency/Jurisdiction	Title	Name	Participating Jurisdiction	Stakeholder	Meetings ¹ Attended
Los Osos	General Manager (prior)	Renee Osborne	X		Mtg #2; Mtg #3
Los Osos	General Manager	Ron Munds	X		
Nipomo	General Manager	Mario Iglesias	X		Mtg #3; Mtg #4
San Miguel	Director of Utilities	Kelly Dodds	X		
San Simeon	Office Manager	Courtney Murguia	X		Mtg #3
San Simeon	General Manager (prior)	Renee Osborne	X		Mtg #2; Mtg #3
Oceano	Administrator	Nicole Miller	X		Kick-off
Oceano	Business & Account Manager	Carey Casciola	X		Kick-off
Templeton	General Manager	Jeff Brilz	X		
Templeton	Fire Chief	Bill White	X		Kick-off; Mtg #2; Mtg #3
Other Stakeholders					
Department of State Hospitals	Chief of Plant Operations	Tom Smet		X	Kick-off
Department of State Hospitals	PIO	Phil Koziel		X	Kick-off
Department of State Hospitals	Atascadero, Joint Commission Coordinator	Rebecca Herzig		X	Mtg #2
California Men's Colony	Associate Warden	Jason Steck		X	Kick-off
Coastal Commission		Brian O'Neill		X	
Coastal Commission		Alex McCoy		X	
California State University – Cal Poly, SLO	Professor	Bill Siembieda		X	Kick-off
California State University – Cal Poly, SLO	Professor	Michael Boswell		X	
Xolon Salinan Tribe		Karen White		X	
Tenet Health		Rick Ford		X	
Resident		Ken Topping		X	Kick-off
Cayucos Elementary	School Nurse/Safety Coordinator	Nessa Garcia		X	Mtg #2

Agency/Jurisdiction	Title	Name	Participating Jurisdiction	Stakeholder	Meetings ¹ Attended
Wood Environment and Infrastructure Solutions, Inc. (consultant)	Project Manager	Jeff Brislawn			
Wood	Senior Planner	Scott Field			
Wood	Senior Planner	Dan Gira			
Wood	Senior Planner	Julia Pujo			
Wood	Planner	Amy Carr			
Wood	GIS Analyst/Planner	Marta Blanco Castano			
Wood	Planner	Kaylan Lamb			
Wood	Planner	Hannah Thomas			

APPENDIX B: MITIGATION CATEGORIES AND ALTERNATIVES

Categories of Mitigation Measures Considered

PREVENTION: Preventive measures are designed to keep the problem from occurring or getting worse. Their objective is to ensure that future development is not exposed to damage and does not increase damage to other properties.

- Planning
- Zoning
- Open Space Preservation
- Land Development Regulations
 - Subdivision regulations
 - floodplain development regulations
- Storm Water Management
- Fuels Management, Fire-Breaks
- Building Codes
 - Fire-Wise Construction
- (See Property Protection also)

EMERGENCY SERVICES measures protect people during and after a disaster. A good emergency services program addresses all hazards. Measures include:

- Warning (floods, tornadoes, ice storms, hail storms, dam failures)
 - NOAA Weather Radio
 - Sirens
 - Reverse 911
- Evacuation & Sheltering
- Communications
- Emergency Planning
 - Activating the emergency operations room (emergency management)
 - Closing streets or bridges (police or public works)
 - Shutting off power to threatened areas (utility company)
 - Holding children at school/releasing children from school (school district)
 - Passing out sand and sandbags (public works)
 - Ordering an evacuation (mayor)

- Opening evacuation shelters (Red Cross)
- Monitoring water levels (engineering)
- Security and other protection measures (police)
- Monitoring of Conditions (dams)
- Critical Facilities Protection (Buildings or locations vital to the response and recovery effort, such as police/fire stations, hospitals, sewage treatment plants/lift stations, power substations)
 - Buildings or locations that, if damaged, would create secondary disasters, such as hazardous materials facilities and nursing homes
 - Lifeline Utilities Protection
 - Health & Safety Maintenance

PROPERTY PROTECTION: Property protection measures are used to modify buildings subject to damage rather than to keep the hazard away. A community may find these to be inexpensive measures because often they are implemented by or cost-shared with property owners. Many of the measures do not affect the appearance or use of a building, which makes them particularly appropriate for historical sites and landmarks.

- Retrofitting/disaster proofing
 - Floods
 - Wet/Dry floodproofing (barriers, shields, backflow valves)
 - Relocation
 - Acquisition
 - Tornadoes
 - Safe Rooms
 - Securing roofs and foundations with fasteners and tie-downs
 - Strengthening garage doors and other large openings
 - Drought
 - Improve water supply (transport/storage/conservation)
 - Remove moisture competitive plants (Tamarisk/Salt Cedar)
 - Water Restrictions/Water Saver Sprinklers/Appliances
 - Grazing on CRP lands (no overgrazing-see Noxious Weeds)
 - Create incentives to consolidate/connect water services
 - Recycled wastewater on golf courses
 - Earthquakes
 - Removing masonry overhangs, bracing other parts.

- Tying down appliances, water heaters, bookcases and fragile furniture so they won't fall over during a quake.
- Installing flexible utility connections that won't break during shaking (pipelines too!)
- Wildfire, Grassfires
 - Replacing building components with fireproof materials
- Roofing, screening
 - Create "Defensible Space"
 - Installing spark arrestors
 - Fuels Modification
- Noxious Weeds/Insects
 - Mowing
 - Spraying
 - Replacement planting
 - Stop overgrazing
 - Introduce natural predators
- Insurance

NATURAL RESOURCE PROTECTION: Natural resource protection activities are generally aimed at preserving (or in some cases restoring) natural areas. In so doing, these activities enable the naturally beneficial functions of floodplains and watersheds to be better realized. These natural and beneficial floodplain functions include the following:

- storage of floodwaters
- absorption of flood energy
- reduction in flood scour
- infiltration that absorbs overland flood flow
- groundwater recharge
- removal/filtering of excess nutrients, pollutants, and sediments from floodwaters
- habitat for flora and fauna
- recreational and aesthetic opportunities

Methods of protecting natural resources include:

- Erosion & Sediment Control
- Wetlands Protection
- Riparian Area/Habitat Protection
- Threatened & Endangered Species Protection

- Fuels Management
- Set-back regulations/buffers
- Best Management Practices

Best management practices (“BMPs”) are measures that reduce nonpoint source pollutants that enter the waterways. Nonpoint source pollutants come from non-specific locations. Examples of nonpoint source pollutants are lawn fertilizers, pesticides, and other farm chemicals, animal wastes, oils from street surfaces and industrial areas and sediment from agriculture, construction, mining and forestry. These pollutants are washed off the ground’s surface by stormwater and flushed into receiving storm sewers, ditches and streams. BMPs can be implemented during construction and as part of a project’s design to permanently address nonpoint source pollutants. There are three general categories of BMPs:

1. Avoidance: setting construction projects back from the stream.
2. Reduction: Preventing runoff that conveys sediment and other water-borne pollutants, such as planting proper vegetation and conservation tillage.
3. Cleanse: Stopping pollutants after they are en route to a stream, such as using grass drainageways that filter the water and retention and detention basins that let pollutants settle to the bottom before they are drained

- Dumping Regulations
- Water Use Restrictions
- Weather Modification
- Landscape Management

STRUCTURAL PROJECTS have traditionally been used by communities to control flows and water surface elevations. Structural projects keep flood waters away from an area. They are usually designed by engineers and managed or maintained by public works staff. These measures are popular with many because they “stop” flooding problems. However, structural projects have several important shortcomings that need to be kept in mind when considering them for flood hazard mitigation:

- They are expensive, sometimes requiring capital bond issues and/or cost sharing with Federal agencies, such as the U.S. Army Corps of Engineers or the Natural Resources Conservation Service.
- They disturb the land and disrupt natural water flows, often destroying habitats.

- They are built to a certain flood protection level that can be exceeded by a larger flood, causing extensive damage.
- They can create a false sense of security when people protected by a structure believe that no flood can ever reach them.
- They require regular maintenance to ensure that they continue to provide their design protection level.

Structural measures include:

- Detention/Retention structures
- Erosion and Sediment Control
- Basins/Low-head Weirs
- Channel Modifications
- Culvert resizing/replacement/Maintenance
- Levees and Floodwalls
- Fencing (for snow, sand, wind)
- Drainage System Maintenance
- Reservoirs(for flood control, water storage, recreation, agriculture)
- Diversions
- Storm Sewers

PUBLIC INFORMATION: A successful hazard mitigation program involves both the public and private sectors. Public information activities advise property owners, renters, businesses, and local officials about hazards and ways to protect people and property from these hazards. These activities can motivate people to take protection

- Hazard Maps and Data
- Outreach Projects
 - (mailings, media, web, speakers bureau)
- Library Resources
- Real Estate Disclosure
- Environmental Education
- Technical Assistance

Alternative Mitigation Measures per Category

Prevention

Preventive measures are designed to keep the problem from occurring or getting worse. Their objective is to ensure that future development is not exposed to damage and does not increase damage to other properties.

- Planning
- Zoning
- Open space preservation
- Land development regulations
 - Subdivision regulations
 - Floodplain development regulations
- Stormwater management
- Fuels management, fire breaks
- Building codes
 - Firewise construction
- (also see Property Protection)

Emergency Services

Emergency services protect people during and after a disaster. A good emergency services program addresses all hazards. Measures include:

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 - NOAA weather radio all hazards
 - Sirens
 - Reverse 911
- Evacuation and sheltering
- Communications
- Emergency planning
 - Activating the emergency operations room (emergency management)
 - Closing streets or bridges (police or public works)
 - Shutting off power to threatened areas (utility company)
 - Holding children at school/releasing children from school (school district)
 - Passing out sand and sandbags (public works)
 - Ordering an evacuation (mayor)
 - Opening evacuation shelters (red cross)

- Monitoring water levels (engineering)
- Security and other protection measures (police)
- Monitoring of conditions (dams)
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 - Buildings or locations that, if damaged, would create secondary disasters, such as hazardous materials facilities and nursing homes
 - Lifeline utilities protection
 - Health and safety maintenance

Property Protection

Property protection measures are used to modify buildings subject to damage rather than to keep the hazard away. A community may find these to be inexpensive measures because often they are implemented by or cost-shared with property owners. Many of the measures do not affect the appearance or use of a building, which makes them particularly appropriate for historical sites and landmarks.

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 - Relocation
 - Acquisition
 - Tornadoes
 - Safe rooms
 - Securing roofs and foundations with fasteners and tie-downs
 - Strengthening garage doors and other large openings
 - Drought
 - Improve water supply (transport/storage/conservation)
 - Remove moisture competitive plants (tamarisk/salt cedar)
 - Water restrictions/water saver sprinklers/appliances
 - Grazing on CRP lands (no overgrazing—see noxious weeds)
 - Create incentives to consolidate/connect water services
 - Recycled wastewater on golf courses
 - Earthquakes
 - Removing masonry overhangs, bracing other parts

- Tying down appliances, water heaters, bookcases and fragile furniture so they will not fall over during a quake.
- Installing flexible utility connections that will not break during shaking (pipelines, too)
- Wildland fire
 - Replacing building components with fireproof materials (roofing, screening)
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 - Installing spark arrestors
 - Fuels modification
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 - Spraying
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Natural Resource Protection

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- Reduction in flood scour
- Infiltration that absorbs overland flood flow
- Groundwater recharge
- Removal/filtering of excess nutrients, pollutants, and sediments from floodwaters
- Habitat for flora and fauna
- Recreational and aesthetic opportunities

Methods of protecting natural resources include:

- Erosion and sediment control
- Wetlands protection
- Riparian area/habitat protection

- Threatened and endangered species protection
- Fuels management
- Set-back regulations/buffers
- Best management practices—Best management practices (“BMPs”) are measures that reduce nonpoint source pollutants that enter the waterways. Nonpoint source pollutants come from non-specific locations. Examples of nonpoint source pollutants are lawn fertilizers, pesticides, and other farm chemicals, animal wastes, oils from street surfaces and industrial areas and sediment from agriculture, construction, mining and forestry. These pollutants are washed off the ground’s surface by stormwater and flushed into receiving storm sewers, ditches and streams. BMPs can be implemented during construction and as part of a project’s design to permanently address nonpoint source pollutants. There are three general categories of BMPs:
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 - Reduction—Preventing runoff that conveys sediment and other water-borne pollutants, such as planting proper vegetation and conservation tillage.
 - Cleanse—Stopping pollutants after they are en route to a stream, such as using grass drainageways that filter the water and retention and detention basins that let pollutants settle to the bottom before they are drained
- Dumping regulations
- Water use restrictions
- Weather modification
- Landscape management

Structural Projects

Structural projects have traditionally been used by communities to control flows and water surface elevations. Structural projects keep flood waters away from an area. They are usually designed by engineers and managed or maintained by public works staff. These measures are popular with many because they “stop” flooding problems. However, structural projects have several important shortcomings that need to be kept in mind when considering them for flood hazard mitigation:

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- They disturb the land and disrupt natural water flows, often destroying habitats.

- They are built to a certain flood protection level that can be exceeded by a larger flood, causing extensive damage.
- They can create a false sense of security when people protected by a structure believe that no flood can ever reach them.
- They require regular maintenance to ensure that they continue to provide their design protection level.

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- Erosion and sediment control
- Basins/low-head weirs
- Channel modifications
- Culvert resizing/replacement/maintenance
- Levees and floodwalls
- Fencing (for snow, sand, wind)
- Drainage system maintenance
- Reservoirs (for flood control, water storage, recreation, agriculture)
- Diversions
- Storm sewers

Public Information

A successful hazard mitigation program involves both the public and private sectors. Public information activities advise property owners, renters, businesses, and local officials about hazards and ways to protect people and property from these hazards. These activities can motivate people to take protection

- Hazard maps and data
- Outreach projects (mailings, media, web, speakers bureau)
- Library resources
- Real estate disclosure
- Environmental education
- Technical assistance

Mitigation Alternative Selection Criteria

The following criteria were used to select and prioritize proposed mitigation measures:

STAPLE/E

- **Social**—Does the measure treat people fairly? (different groups, different generations)
- **Technical**—Will it work? (Does it solve the problem? Is it feasible?)
- **Administrative**—Do you have the capacity to implement and manage project?
- **Political**—Who are the stakeholders? Did they get to participate? Is there public support? Is political leadership willing to support?
- **Legal**—Does your organization have the authority to implement? Is it legal? Are there liability implications?
- **Economic**—Is it cost-beneficial? Is there funding? Does it contribute to the local economy or economic development?
- **Environmental**—Does it comply with environmental regulations?

Sustainable Disaster Recovery

- Quality of life
- Social equity
- Hazard mitigation
- Economic development
- Environmental protection/enhancement
- Community participation

Smart Growth Principles

- Infill versus sprawl
- Efficient use of land resources
- Full use of urban resources
- Mixed uses of land
- Transportation options
- Detailed, human-scale design

Other

- Does measure address area with highest risk?
- Does measure protect ...
 - The largest # of people exposed to risk?
 - The largest # of buildings?
 - The largest # of jobs?

- The largest tax income?
- The largest average annual loss potential?
- The area impacted most frequently?
- Critical infrastructure (access, power, water, gas, telecommunications)?
- What is timing of available funding?
- What is visibility of project?
- Community credibility

Mitigation Action Selection and Prioritization Criteria

Does the proposed action protect lives?

Does the proposed action address hazards or areas with the highest risk?

Does the proposed action protect critical facilities, infrastructure, or community assets?

Does the proposed action meet multiple objectives (multi-objective management)?

STAPLE/E

Developed by FEMA, this method of applying evaluation criteria enables the planning team to consider in a systematic way the social, technical, administrative, political, legal, economic, and environmental opportunities and constraints of implementing a particular mitigation action. For each action, the HMPC should ask, and consider the answers to, the following questions:

Social

Does the measure treat people fairly (different groups, different generations)?

Technical

Will it work? (Does it solve the problem? Is it feasible?)

Administrative

Is there capacity to implement and manage project?

Political

Who are the stakeholders? Did they get to participate? Is there public support? Is political leadership willing to support it?

Legal

Does your organization have the authority to implement? Is it legal? Are there liability implications?

Economic

Is it cost-beneficial? Is there funding? Does it contribute to the local economy or economic development? Does it reduce direct property losses or indirect economic losses?

Environmental

Does it comply with environmental regulations or have adverse environmental impacts

Example Mitigation Action Items by Community Rating System Mitigation Category and Hazard

Alternative Mitigation Actions	Biological Agents	Dam Failure	Floods	Landslides, Land Subsidence	Adverse Weather (hail, lightning, wind, temps, fog, drought, tornadoes)	Earthquake	Wildfire	Coastal Storms/ Erosion/ Sea Level Rise/ Tsunami	Hazardous Materials
PREVENTION									
Building codes and enforcement			■	■	■	■	■	■	■
Comprehensive Watershed Tax			■						
Density controls		■	■	■			■	■	■
Design review standards			■	■		■	■	■	■
Easements			■	■			■	■	■
Environmental review standards			■	■		■	■	■	■
Floodplain development regulations		■	■						■
Hazard mapping		■	■	■			■	■	■
Floodplain zoning		■	■						■
Forest fire fuel reduction							■		
Housing/landlord codes					■		■		
Slide-prone area/grading/hillside development regulations				■			■	■	
Manufactured home guidelines/regulations		■	■		■	■			
Multi-Jurisdiction cooperation within watershed		■	■						
Open space preservation		■	■	■			■	■	
Performance standards		■	■	■	■	■	■	■	
Special use permits		■	■	■			■		
Stormwater management regulations			■						
Subdivision and		■	■	■		■	■	■	■

Alternative Mitigation Actions	Biological Agents	Dam Failure	Floods	Landslides, Land Subsidence	Adverse Weather (hail, lightning, wind, temps, fog, drought, tornadoes)	Earthquake	Wildfire	Coastal Storms/ Erosion/ Sea Level Rise/ Tsunami	Hazardous Materials
development regulations									
Surge protectors and lightning protection					■				
Tree Management					■		■	■	
Transfer of development rights			■	■			■	■	
Utility location				■	■			■	■
PROPERTY PROTECTION									
Acquisition of hazard prone structures		■	■	■			■	■	
Construction of barriers around structures		■	■					■	■
Elevation of structures		■	■					■	
Relocation out of hazard areas		■	■	■			■	■	■
Non structural improvements (safety film on windows, bookshelf anchoring, critical equipment bracing etc.)					■	■			
Structural retrofits (e.g., reinforcement, floodproofing, bracing, etc.			■		■	■	■	■	■
PUBLIC EDUCATION AND AWARENESS									
Debris Control			■						
Flood Insurance		■	■					■	
Hazard information centers	■	■	■	■	■	■	■	■	

Alternative Mitigation Actions	Biological Agents	Dam Failure	Floods	Landslides, Land Subsidence	Adverse Weather (hail, lightning, wind, temps, fog, drought, tornadoes)	Earthquake	Wildfire	Coastal Storms/ Erosion/ Sea Level Rise/ Tsunami	Hazardous Materials
Public education and outreach programs	■	■	■	■	■	■	■	■	■
Real estate disclosure		■	■	■	■	■	■	■	
Crop Insurance					■	■			
NATURAL RESOURCE PROTECTION									
Best Management Practices (BMPs)	■		■	■	■		■	■	■
Forest and vegetation management	■	■	■	■	■		■	■	
Hydrological Monitoring	■	■	■	■	■				
Sediment and erosion control regulations		■	■	■				■	
Stream corridor restoration			■	■					
Stream dumping regulations			■						■
Urban forestry and landscape management		■	■	■	■		■	■	
Wetlands development regulations			■	■			■	■	
EMERGENCY SERVICES									
Critical facilities protection		■	■	■	■	■	■	■	■
Emergency response services		■	■	■	■	■	■	■	■
Hazard threat recognition	■	■	■	■	■	■	■	■	■
Hazard warning systems (community sirens, NOAA weather radio)		■	■	■	■	■	■	■	■
Evacuation planning	■	■	■	■			■		
STRUCTURAL PROJECTS									

Alternative Mitigation Actions	Biological Agents	Dam Failure	Floods	Landslides, Land Subsidence	Adverse Weather (hail, lightning, wind, temps, fog, drought, tornadoes)	Earthquake	Wildfire	Coastal Storms/ Erosion/ Sea Level Rise/ Tsunami	Hazardous Materials
Channel maintenance			■						
Dams/reservoirs (including maintenance)		■	■						
Levees and floodwalls (including upgrades)			■					■	
Safe room/shelter					■	■		■	
Snow fences								■	
Water supply augmentation					■				
Post-disaster mitigation	■	■	■	■	■	■	■	■	■

Appendix C: Planning Process Documentation

From: Jillian H. Ferguson <jferguson@co.slo.ca.us>
Sent: Friday, January 11, 2019 11:50 AM
To: Brislawn, Jeff P
Subject: FW: Request to Participate in the Multi-Jurisdictional Hazard Mitigation Update

From: Jillian H. Ferguson
Sent: Monday, January 07, 2019 9:26 AM
To: 'mdowning@arroyogrande.org' <mdowning@arroyogrande.org>; 'jbergman@arroyogrande.org' <jbergman@arroyogrande.org>; 'slieberman@fivecitiesfire.org' <slieberman@fivecitiesfire.org>; 'cbryson@atascadero.org' <cbryson@atascadero.org>; 'commdev@groverbeach.org' <commdev@groverbeach.org>; 'jpeters@gbpd.org' <jpeters@gbpd.org>; 'sknuckles@morrobayca.gov' <sknuckles@morrobayca.gov>; 'jwinklepleck@pismobeach.org' <jwinklepleck@pismobeach.org>; 'meverling@pismobeach.org' <meverling@pismobeach.org>; 'mgruver@pismobeach.org' <mgruver@pismobeach.org>; 'kaggson@slocity.org' <kaggson@slocity.org>; 'Hagemann.associates@gmail.com' <Hagemann.associates@gmail.com>; 'gm@groundsquirrelhollowcsd.org' <gm@groundsquirrelhollowcsd.org>; 'scott@heritageranchcsd.com' <scott@heritageranchcsd.com>; 'jason@heritageranchcsd.com' <jason@heritageranchcsd.com>; 'rosborne@losososcscsd.org' <rosborne@losososcscsd.org>; 'miglesias@ncsd.ca.gov' <miglesias@ncsd.ca.gov>; 'darrell.gentry@sanmiguelcsd.org' <darrell.gentry@sanmiguelcsd.org>; 'kelly.dodds@sanmiguelcsd.org' <kelly.dodds@sanmiguelcsd.org>; 'tbroom@templetoncsd.org' <tbroom@templetoncsd.org>; 'chief@templetoncsd.org' <chief@templetoncsd.org>; 'jbriltz@templetoncsd.org' <jbriltz@templetoncsd.org>; 'rkoon@cayucosscsd.org' <rkoon@cayucosscsd.org>; 'dcrawford@cayucosscsd.org' <dcrawford@cayucosscsd.org>; 'clerk1csd@cayucosscsd.org' <clerk1csd@cayucosscsd.org>; Dave Flynn <dflynn@co.slo.ca.us>; 'chrism@portsanluis.com' <chrism@portsanluis.com>; 'andreal@portsanluis.com' <andreal@portsanluis.com>; 'paavo@oceanocscsd.org' <paavo@oceanocscsd.org>; 'nicole@oceanocscsd.org' <nicole@oceanocscsd.org>
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Subject: Request to Participate in the Multi-Jurisdictional Hazard Mitigation Update

Good morning,

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The emphasis of DMA 2000 is on creating an ongoing, community-wide planning process that involves the Hazard Mitigation Planning Committee, the public and other key stakeholders. The County Department of Planning and Building is taking the lead on the project in coordination with a Hazard Mitigation Planning Committee (HMPC) comprised of various County departments, municipalities, special districts and other stakeholders. It is the County Department of Planning and Building's hope that you will participate as a member of the HMPC, ensuring an all-inclusive final plan. The final plan will allow participants to be eligible for federal and state mitigation grant funding.

A key component of this update is the multi-jurisdictional aspect. For the first time, several individual HMPs will be combined into the overall County HMP during the update process. The HMPC is anticipated to include representatives from the following local governments:

- County of San Luis Obispo
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- Incorporation of the Oceano Community Service District's LHMP, which is being developed concurrently.

It is important that the update effort has full participation in the planning process, including representation and input, from each of the participating jurisdictions. Participation requirements include:

- Attending and participating in the HMPC meetings (four are anticipated over the next six months)
- Reviewing jurisdictional annexes and providing other updated information and requested data (as available)
- Identifying progress on existing mitigation actions (where applicable in existing HMPs) and providing input on potential new actions
- Reviewing and providing comments on plan drafts
- Informing the public, local officials, and other interested parties about the planning process and providing opportunity for them to comment on the plan
- Coordinating, and participating in the public input process
- Coordinating the formal adoption of the plan by the entity's governing board

Please reply to this notice indicating your agency's willingness to participate in the 2019 update and provide a point of contact. Please respond by this Thursday, January 10th and I look forward to hearing from you. Please also reply if you decline to participate.

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The kickoff meeting is tentatively scheduled for Friday, January 25, 2019. The purpose of the meeting is to introduce and outline the process, review the identified hazards, begin the data collect information effort, plan for stakeholder and public involvement, and answer any questions. Please plan to attend or send an alternate if you cannot.

Sincerely,
Jillian Ferguson,
Project Manager

Jillian Ferguson
Planner, Long Range Division

(p): 805-781-1391

jferguson@co.slo.ca.us

COUNTY OF SAN LUIS OBISPO

DEPARTMENT OF PLANNING & BUILDING

From: Jillian H. Ferguson <jferguson@co.slo.ca.us>
Sent: Friday, January 11, 2019 11:50 AM
To: Brislawn, Jeff P
Subject: FW: Request to Participate in the Multi-Jurisdictional Hazard Mitigation Update

From: Jillian H. Ferguson
Sent: Monday, January 07, 2019 1:20 PM
To: 'jstornetta@prcity.com' <jstornetta@prcity.com>
Subject: Request to Participate in the Multi-Jurisdictional Hazard Mitigation Update

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Sincerely,
Jillian Ferguson,
Project Manager

Jillian Ferguson
Planner, Long Range Division
(p): 805-781-1391
jferguson@co.slo.ca.us
COUNTY OF SAN LUIS OBISPO
DEPARTMENT OF PLANNING & BUILDING

From: Jillian H. Ferguson <jferguson@co.slo.ca.us>
Sent: Friday, January 11, 2019 11:44 AM
To: Brislawn, Jeff P
Subject: FW: Request to Participate in the Multi-Jurisdictional Hazard Mitigation Update

From: Jillian H. Ferguson
Sent: Thursday, January 10, 2019 3:12 PM
To: Marc Lea <mlea@co.slo.ca.us>; Lynda Auchinachie <lauchinachie@co.slo.ca.us>; Leslie Terry <lterry@co.slo.ca.us>; Craig Piper <capiper@co.slo.ca.us>; Carolyn Huber <chuber@co.slo.ca.us>; Elizabeth Kavanaugh <ekavanaugh@co.slo.ca.us>; Shaun E. Cooper <secooper@co.slo.ca.us>; nz5698_att.com <nz5698@att.com>; 'timothy.lindsay@charter.com' <timothy.lindsay@charter.com>; 'lxw1@pge.com' <lxw1@pge.com>; 'rplakias@semprautilities.com' <rplakias@semprautilities.com>; 'vpedersen@semprautilities.com' <vpedersen@semprautilities.com>; 'avilacsd@gmail.com' <avilacsd@gmail.com>; 'hagemann.associates@gmail.com' <hagemann.associates@gmail.com>; 'cayucosfire@sbcglobal.net' <cayucosfire@sbcglobal.net>; 'cayucosfiredept@sbcglobal.net' <cayucosfiredept@sbcglobal.net>; 'Thepopester69@hotmail.com' <Thepopester69@hotmail.com>; 'ldees@gswater.com' <ldees@gswater.com>; 'natalie.chow@gswater.com' <natalie.chow@gswater.com>; 'markz@gswater.com' <markz@gswater.com>; 'medson@smmwc.com' <medson@smmwc.com>; 'darrell.gentry@sanmiguelcsd.org' <darrell.gentry@sanmiguelcsd.org>; 'smv7800@hotmail.com' <smv7800@hotmail.com>; 'johne@squirecanyoncsd.com' <johne@squirecanyoncsd.com>; 'jclemons@sslcsd.us' <jclemons@sslcsd.us>; 'admin@us-ltrcd.org' <admin@us-ltrcd.org>; 'stustoddard@atausd.org' <stustoddard@atausd.org>; 'jackiemartin@atasusd.org' <jackiemartin@atasusd.org>; Hannah Held <hheld@cayucosschool.org>; 'lwright@coastusd.org' <lwright@coastusd.org>; 'emaduli@cuesta.edu' <emaduli@cuesta.edu>; 'duane.whittemore@lmusd.org' <duane.whittemore@lmusd.org>; 'ghoskins@pasoschools.org' <ghoskins@pasoschools.org>; 'gcampos@pleasant-valley-school.org' <gcampos@pleasant-valley-school.org>; 'mdawson@slcsd.org' <mdawson@slcsd.org>; 'narnall@smjUSD.k12.ca.us' <narnall@smjUSD.k12.ca.us>; 'dsmith@smjUSD.k12.ca.us' <dsmith@smjUSD.k12.ca.us>; 'ccrawford@shandon.echalk.com' <ccrawford@shandon.echalk.com>; 'jprice@shandon.k12.ca.us' <jprice@shandon.k12.ca.us>; 'jbarber@tusdnet.k12.ca.us' <jbarber@tusdnet.k12.ca.us>; 'drobinson@coastal.ca.gov' <drobinson@coastal.ca.gov>; 'Brooke.Gutierrez@parks.ca.gov' <Brooke.Gutierrez@parks.ca.gov>; 'doug.barker@parks.ca.gov' <doug.barker@parks.ca.gov>; 'melissa.streder_dot.ca.gov' <melissa.streder@dot.ca.gov>; 'brandon.sanderson@wildlife.ca.gov' <brandon.sanderson@wildlife.ca.gov>; 'Linda.Moua@wildlife.ca.gov' <Linda.Moua@wildlife.ca.gov>; 'sarah.paulson@wildlife.ca.gov' <sarah.paulson@wildlife.ca.gov>; 'pad@co.santa-barbara.ca.us' <pad@co.santa-barbara.ca.us>; 'lorelleio@co.kern.ca.us' <lorelleio@co.kern.ca.us>; 'novom@co.monterey.ca.us' <novom@co.monterey.ca.us>; 'tpresser@waterboards.ca.gov' <tpresser@waterboards.ca.gov>; 'phammer@waterboards.ca.gov' <phammer@waterboards.ca.gov>; 'Lucas.Sharkey@waterboards.ca.gov' <Lucas.Sharkey@waterboards.ca.gov>; 'ccastellon@blm.gov' <ccastellon@blm.gov>; 'julie_vanderwier@fws.gov' <julie_vanderwier@fws.gov>; 'roger_root@fws.gov' <roger_root@fws.gov>; 'glen_knowles@fws.gov' <glen_knowles@fws.gov>; 'collette_thogerson@fws.gov' <collette_thogerson@fws.gov>
Cc: Jay Johnson <jgjohnson@co.slo.ca.us>; Scott Milner <smilner@co.slo.ca.us>
Subject: Request to Participate in the Multi-Jurisdictional Hazard Mitigation Update

Dear Stakeholder:

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updating the 2014 Hazard Mitigation Plan to meet the requirements of the Disaster Mitigation Act of 2000 (DMA 2000). The DMA 2000 requires all local governments to have an approved Multi-Hazard Mitigation Plan in place in order to maintain their eligibility for certain Pre- and Post-disaster funding utilized to protect communities from future disaster damages. The emphasis of DMA 2000 is on creating an ongoing, community-wide planning process that involves a Hazard Mitigation Planning Committee, the public and other key stakeholders.

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A kickoff meeting is tentatively scheduled for Friday, January 25, 2019 from 2pm to 4pm at the New Government Center, Room 161. If you can participate, a formal invitation will be sent, following an email of confirmation. The purpose of the meeting is to introduce and outline the process, review the identified hazards, begin the data collect information effort, plan for stakeholder and public involvement, and answer any questions. The bulk of the planning process will take place between January-July 2019.

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Sincerely,

Jillian Ferguson,
Project Manager

Jillian Ferguson
Planner, Long Range Division
(p): 805-781-1391
jferguson@co.slo.ca.us
COUNTY OF SAN LUIS OBISPO
DEPARTMENT OF PLANNING & BUILDING

From: Jillian H. Ferguson <jferguson@co.slo.ca.us>
Sent: Friday, January 11, 2019 11:44 AM
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From: Jillian H. Ferguson
Sent: Friday, January 11, 2019 10:24 AM
To: 'pio@solcog.org' <pio@solcog.org>; 'dt5314@gmail.com' <dt5314@gmail.com>; 'mboswell@calpoly.edu' <mboswell@calpoly.edu>; 'rick.ford@tenethealth.com' <rick.ford@tenethealth.com>; 'Phillip.koziel@dsh.ca.gov' <Phillip.koziel@dsh.ca.gov>; 'fcollins@northernchumash.org' <fcollins@northernchumash.org>; 'xolon.salinan.heritage@gmail.com' <xolon.salinan.heritage@gmail.com>; 'salinantribe@aol.com' <salinantribe@aol.com>; 'olivas.mona@gmail.com' <olivas.mona@gmail.com>; 'kentopping@aol.com' <kentopping@aol.com>
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jferguson@co.slo.ca.us

COUNTY OF SAN LUIS OBISPO

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COUNTY OF SAN LUIS OBISPO

DEPARTMENT OF PLANNING & BUILDING

San Luis Obispo County Multi-Jurisdictional Hazard Mitigation Plan 2019 Update

Kick-Off Meeting Summary

2-4 pm

January 25, 2019

County Government Center Rm 161
1055 Monterey St., San Luis Obispo, CA

Introductions and Opening Remarks

Jillian Ferguson with the San Luis Obispo (SLO) County Planning Department began the meeting with welcoming remarks and introduced Jeff Brislawn, project manager at Wood Environment & Infrastructure Solutions, Inc. (Wood), the consulting firm hired to facilitate the planning process and develop the updated County plan. Jeff introduced Dan Gira with the Wood Santa Barbara office and asked everyone around the room to introduce themselves. Thirty-three (33) persons representing a mix of county departments, local governments, special districts and stakeholders were present and documented on a sign-in sheet. County representatives included Planning, Office of Emergency Services, Public Works, Civic Spark and the Agriculture department.

Municipalities:

- City of San Luis Obispo Fire Department
- Arroyo Grande
- Atascadero
- Five Cities Fire
- Morro Bay
- Paso Robles

Community Service Districts and Special Districts:

- Avila Beach CSD
- Ground Squirrel Hollow CSD
- Heritage Ranch CSD
- Oceano CSD
- Port San Luis Harbor District
- Templeton CSD

Stakeholders and other interested parties present included:

- SLO County Fire Safe Council
- Cal Poly – City and Regional Planning Department professor
- Member of the public/interested party

Jeff asked how many had participated in a local hazard mitigation planning process and several raised their hands. Following a brief safety moment related to Tsunamis Jeff discussed the agenda items; the key discussion is summarized below and additional details are within the meeting PowerPoint presentation.

Mitigation Planning and the Disaster Mitigation Act Requirements

Jeff presented PowerPoint slides that outlined the planning process and the Disaster Mitigation Act (DMA) of 2000 Requirements. Jeff also mentioned the increase in the number of disaster incidents and the corresponding increase in recovery costs in California and nationwide in recent years. The upside of these disasters is that more funding is becoming available for mitigation projects. The SLO Hazard Mitigation Plan (HMP) will be updated in accordance with the DMA 2000. The planning process involves a 4 Phase approach with 9 steps per FEMA guidance updated in 2013. The update will also align with the Community Rating System (CRS) 10 step floodplain management planning process, which be an added benefit to the City of San Luis Obispo and City of Morro Bay who participate in the program.

An important aspect of the plan update is that it's needed to be eligible for FEMA mitigation grant funding. Additionally, local governmental agencies that have incorporated the HMP by reference into their General Plans are eligible to receive a potentially higher state share of California Disaster Assistance Act funding post-disaster. Jeff emphasized the importance and benefits of hazard mitigation planning and the types of mitigation projects that can be funded if eligibility requirements are met. In California, these projects have included wildfire mitigation/fuels treatment, flood reduction/drainage improvements, landslide stabilization, generators and warning systems. Recent changes in FEMA policy now make certain levee projects eligible, provided they don't duplicate another federal program, and 'climate resilient' activities including groundwater recharge for drought mitigation and green infrastructure for stormwater mitigation.

Objectives and Schedule for the HIRA Update

The HMP update will be based on existing documents and studies, with the SLO County Hazard Mitigation Plan (2014) and other existing municipal HMPs providing the baseline for identified hazards and the groundwork for policies and actions for hazard mitigation.

Aspects of the planning process include:

- Engage the municipal government participants to create jurisdiction-specific annexes to the plan
- Include other special districts and community service districts in the plan update
- Raise awareness and engage the public
- Update hazards and baseline development data to reflect current conditions
- Update the mitigation strategy

The HMP will be updated over the next six months, with at least two more meetings with the Hazard Mitigation Planning Committee. Wood will be updating the Hazard Identification and Risk Assessment (HIRA) in the next couple of months, with input from the HMPC. Three drafts of the HMP will be created: the first for review by HMPC committee, a second for public review, and a third for state and FEMA review. The first draft for HMPC review is targeted for mid-June 2019, and a public review draft in July. The HMP update will also inform a parallel effort to update the safety element of the SLO County General Plan.

Role of the Hazard Mitigation Planning Committee (HMPC)

The County and participating jurisdictions (local governments including special districts and community service districts) will comprise the HMPC to provide input into the plan update. A key component of this update is the multi-jurisdictional aspect. Several individual HMPs will be combined into the overall County HMP during the update process. The HMPC is anticipated to include representatives from the following local governments:

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- Incorporation of the Oceano Community Service District's LHMP, which is being developed concurrently.

A HMPC member noted that not all of the special districts and potentially eligible jurisdictions were listed. The County OES representative replied that all were invited to participate during the planning grant development and these were communities that signed commitment letters to participate.

Jeff emphasized that local input, and participation from the county, municipalities, special districts and community service districts is required for full approval from FEMA. Participation includes the following:

- Attend meetings and participate in the planning process
- Provide requested information to update or develop jurisdictional annexes
- Review drafts and provide comments
- Identify mitigation projects specific to jurisdiction, provide status
- Assist with and participate in the public input process
- Coordinate formal adoption

Stakeholders include other local, state and federal agencies with a stake in hazard mitigation in the County or may include academic institutions and local business and industry. State and federal government examples include CalDWR, CalFire, Cal OES, U.S. Forest Service and Bureau of Reclamation. Cal Poly, gas and electric utility providers have also been invited as stakeholders. Neighboring counties will be notified about the update and given an opportunity to provide input into the process. Stakeholders have various options and levels of participation including:

- Attend HMPC meetings or stay in loop via email list
- Provide data/information
- Partner on mitigation efforts
- Review draft plan

Review of Identified Hazards

Based on hazards from the 2014 County HMP, the list of potential hazards was reviewed. Jeff showed a slide that listed the hazards in the 2014 HMP. Climate change was also included in the 2014 plan and noted with the hazards that could be affected (probability and intensity), where applicable.

- Adverse Weather
 - Drought
 - Freeze
 - Hail
 - Fog
 - Thunderstorm
 - Tornadoes
 - Wind
- Agricultural pest infestation and plant disease
- Biological agents (naturally occurring)
- Coastal storm/coastal erosion
- Earthquakes, faults, and liquefaction
- Flooding
- Landslide
- Tsunami and seiche
- Wildfire

The group thought that the original list of hazards was still valid with some modifications. Jeff noted that the significance level of hazards will vary by jurisdiction, and some hazards may not be applicable to all jurisdictions. Additional insight and details were learned during the conversation among participants. Highlights of the discussion include:

- Dam Failure: needs to be added as a separate hazard.
- Drought: needs to be separated from Adverse Weather and profiled on its own.
- Flood: The County is in the process of having its NFIP flood maps updated.
- Subsidence: This has become more of a concern due to heavy groundwater withdrawal during the recent severe multi-year drought. It is an issue in the northern part of the county and around the City of San Luis Obispo.
- Debris flow: This should be noted in the landslide and wildfire sections.
- Sea Level Rise: This will be included in the update, either as its own hazard or combined with the coastal erosion hazard.
- Tree Mortality: Significant tree deaths have occurred due to long term drought and insect infestations. Three types of trees have been affected including oak, eucalyptus, and Monterey Pines. This needs to be addressed in the plan update; Jeff recommended tree issues/hazards be addressed within the drought, wind and wildfire sections as consequences of these hazards. A general decline in the amounts of coastal fog in recent years has also been contributing to Monterey Pine mortality.
- Biological agents: There have been recent efforts related to pandemic planning and associated exercises.

The focus of the HMP update is on natural hazards, since human-caused hazards are not required by DMA 2000 regulations and often are dealt with through separate planning mechanisms. There was

discussion on potential human-caused hazards to be included or noted in the 2019 HMP update which included:

- Hazardous materials/transported and fixed facility:
 - Train derailments
 - Oil spills
 - Diablo Canyon nuclear incident
- Civil unrest
- Cyber threats

Jeff will prepare a revised hazard identification list to share via email and finalize with input from the HMPC after the meeting. Jeff noted that every hazard profiled must have at least one mitigation action identified.

Jeff Brislaw asked the group to review the list of hazards and comment on how they could be enhanced or updated with:

- Historic incidents
- Incident logs
- Public perception
- Scientific studies
- Other plans and reports (e.g., flood and drainage studies, CWPPs, Internet databases)
- Recent disasters

Coordinating with Other Agencies\Related Planning Efforts\Recent Studies

A discussion of other agencies that should be coordinated with took place. Those noted included:

- Wildland Urban Interface Institute
- School districts (some concerned with sea level rise)
- Community of Cambria
- Camp Roberts
- Camp Lewis
- Coast Guard
- State Parks
- Groundwater Sustainability Agencies (GSAs) to manage groundwater sustainability within groundwater subbasins defined by the California Department of Water Resources (DWR); it was noted that most of these agencies were represented by the local government participants.

A discussion on recent studies of hazards in other documents and reports followed. Opportunities for coordinating and cross-referencing the HMP were discussed. Recent studies and related planning efforts included:

- The countywide CWPP has recently been updated and going to be approved in March
- Cal Poly evacuation planning model
- County stormwater resources plan

Planning for Public Involvement

How to involve the public was discussed. The public can be a source of information on hazards and mitigation ideas. Public meetings are scoped to be part of the effort, but Jeff recommend 'piggy backing' on other public forums where possible to ensure an audience. Suggestions included:

- Outreach through social media
- Use county and city websites to link to information on plan
- Use the City of San Luis Obispo's Open City Hall web platform
- Use of an online public survey; getting the word out will be key to its success

Data Collection Needs and Next steps

A "Local Hazard Mitigation Plan Update Guide" handout was provided and discussed. Jeff emphasized that this guide is for all local government jurisdictions participating in the plan update. It contains worksheets that will need to be completed with input from each jurisdiction. It is particularly important for jurisdictions that have never been covered by a hazard mitigation plan to fill out the worksheets. **These are due back to Jeff by email February 28th.** A Google Share Drive will be set up for the project to share large documents. A GIS needs list was provided to the County to assist with data collection. The County will provide the meeting summary, handouts, presentation and sign in sheet by email so that other HMPC members that could not attend today's meeting could get up to speed. Jeff noted that he will be in touch to followup on some of the previously identified data sources and plans.

Adjourn

The meeting adjourned at 4:00 pm.

Summary prepared by Jeff Brislawn, Wood

Jeff.brislawn@woodplc.com

303-820-4654

1942 Broadway, Suite 314

Boulder, CO 80302

SIGN-IN SHEET

SAN LUIS OBISPO COUNTY MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN UPDATE PROJECT

HMPC #1 – Kickoff Meeting

Friday January 25, 2019 2:00-4:00pm

New County Government Center RM 161 1055 Monterey St. San Luis Obispo, CA

Name	Jurisdiction/Agency/Dept	Title	Phone	E-mail
William Siembieda	Cal Poly City & Regional Planning	Professor	805 746 6737	wsiemble@calpoly.edu
Jonathan Stornetta	Paso Robles Fire	Fire Chief	805-227-7560	jstornetta@prcity.com
Tom Peterson	Atascadero Fire	Fire Marshal	805-538-9196	tom.peterson@atacadero.org
STEVE LIEBERMAN	FIVE CITIES FIRE	FIRE CHIEF	805 904 4705	slieberman@fivecitiesfire.org
Nicole Miller	Oleano ESD	ACCT Admin III	805 481 6730	nicole@oleanoesd.org
Dan Gilmore	Ground Squirrel Hollow	GM	805/441-4428	dangilmore@pacbell.net
Susan Steck	CMC	Associate Warden	805/547-7902	Susan.Steck@co.slo.ca.gov
LYNDA LUCCHINI	AG DEPT		781-5914	COUNTY
JOE GUZZARDI	SLO CO. OF	EM SVCS. MGR	805 781-5454	JGuzzardi@co.slo.ca.us
Don Turner	SLO County Fire Safe Council	Manager	805-458-3513	firesafe@slo.org
CHRIS READ	CITY OF SLO	SUSTAINABILITY MANAGER	805-791-7151	cread@slocity.org

**Local Hazard Mitigation Plan Update Guide
for
San Luis Obispo County, California
Hazard Mitigation Planning Committee (HMPC)**

Prepared by

Wood

January 2019



Overview

The contents of this workbook have been designed to assist San Luis Obispo County and its jurisdictions (municipalities and special districts) in the 2019 update of the 2014 Multi-Hazard Mitigation Plan, in accordance with the Federal Disaster Mitigation Act (DMA) of 2000 update requirements. The mitigation planning regulation at 44 CFR §201.6(d)(3) states:

A local jurisdiction must review and revise its plan to reflect changes in development, progress in local mitigation efforts, and changes in priorities, and resubmit it for approval within five (5) years in order to continue to be eligible for mitigation project grant funding.

This guide includes a description of the necessary background information needed to support the hazard mitigation plan update process. This includes an update of the hazard identification and vulnerability assessment, revisiting the assessment of San Luis Obispo County's current hazard mitigation capabilities, and a review of the progress on mitigation projects intended to prevent or reduce future losses. The plan's key components will be revisited through a formal planning process, including re-adoption of the plan in order to secure the continued buy-in of participating jurisdictions.

The essential information needed to support the update process includes current background information about San Luis Obispo County and its jurisdictions: plans, technical studies, and data related to hazards and risks; current governing codes, ordinances, regulations, and procedures whose intent is to minimize future losses; and an update of San Luis Obispo County's technical and organizational capabilities to perform hazard mitigation/loss prevention functions. It is important that the plan shows what San Luis Obispo County is doing now to limit future disaster losses and capture any mitigation success stories since 2014.

The planning process is heavily dependent on existing data to be supplied by each of the participants represented on the Hazard Mitigation Planning Committee (HMPC). The DMA plan development process does not require the development of new data but requires **existing data only**. The goal of this process is to produce an updated hazard mitigation plan that meets San Luis Obispo's needs, as well as the requirements of DMA 2000 and that contains a list of updated projects that may be eligible for streamlined federal mitigation funding pre or post disaster.

What is Mitigation?

Hazard mitigation is defined by FEMA as "any sustained action taken to reduce or eliminate long-term risk to human life and property from a hazard event." The results of a three-year, congressionally mandated independent study to assess future savings from mitigation activities provides evidence that mitigation activities are highly cost-effective. On average, each dollar spent on mitigation saves society an average of \$4 in avoided future losses in addition to saving lives and preventing injuries (National Institute of Building Science Multi-Hazard Mitigation Council 2005). An update to this report in 2017 (Natural Hazard Mitigation Saves: 2017 Interim Report) indicates that mitigation grants funded through select federal government agencies, on average, can save the nation \$6 in future disaster costs for every \$1 spent on hazard mitigation.

Mitigation generally means reducing long-term risk from hazards to acceptable levels through predetermined measures accompanying physical development, for example: strengthening structures to withstand high winds or snow loads; elevating, removing or limiting development in flood-prone areas; clearing defensible space around residences in Wildfire Urban Interface (WUI) areas; or designing development away from areas of geological instability. Mitigation can also protect existing development through seismic retrofitting, critical infrastructure protection, floodproofing etc.

Mitigation is different from emergency preparedness or response. Preparedness concentrates on activities which make a person, place, or organization ready to respond to a disaster with emergency equipment, food, emergency shelter, and medicine. Response activities may reduce damages, such as sandbagging during a flood, but this is a short-term solution and requires advance warning and resources to be in place during the event. Mitigation of flood hazards through wise floodplain management and hazard avoidance is an example of a long-term solution.

Participation

The DMA planning regulations and guidance stress that each entity seeking the required FEMA re-approval of their mitigation plan must:

- Participate in the process;
- Detail areas within the planning area where the risk differs from that facing the entire area;
- Identify specific projects to be eligible for funding; and
- Have the governing board formally adopt the plan.

For HMPC members, 'participation' means the planning committee representatives will:

- Attend and participate in HMPC meetings;
- Provide available data that is requested of the HMPC coordinator;
- Provide updates from each jurisdiction's previous local hazard mitigation plan;
- Provide a status report on mitigation actions from *the County and each jurisdiction's* previous plan (where applicable);
- Review and provide/coordinate comments on the updated plan draft;
- Advertise, coordinate and participate in the public input process; and
- Coordinate the formal adoption of the plan by the governing board.

Plan Update and Data Collection Guide

This guide contains an explanation of the types of hazard mitigation/loss prevention data that is needed for the hazard mitigation planning process. This guide identifies specific requirements for the Risk Assessment Process, which includes the Hazard Identification, Vulnerability, and Capability Assessments as well as defines requirements for the update of the Mitigation Strategy.

The worksheets have been developed to assist with the update process. Each jurisdiction should utilize members of their planning subcommittee to review their existing local hazard mitigation plans (if applicable) and complete the worksheet forms. *The jurisdictions that do not have an existing hazard mitigation plan, in particular, should complete the worksheet forms.* A step by step process is included in this guide. Each participating jurisdiction (county, city, or special district) that desires credit for participation in the 2019 update must go through this process. The jurisdictions anticipated to participate in the 2019 plan update include:

- County of San Luis Obispo (lead entity)
- Seven Incorporated Cities (Arroyo Grande, Atascadero, Grover Beach, Morro Bay, Paso Robles, Pismo Beach, San Luis Obispo)
- Eight Community Service Districts (Avila Beach, Ground Squirrel Hollow, Heritage Ranch, Los Osos, Nipomo, San Miguel, San Simeon, Templeton)
- Three other Special Districts (San Luis Obispo County Flood Control and Water Conservation District, Cayucos Sanitary District, Port San Luis Harbor District)
- Incorporation of the Oceano Community Service District's LHMP, which is being developed concurrently.

Below is a list of the jurisdictions that have an approved local hazard mitigation plan. Each municipality with an existing hazard mitigation plan should review their plan prior to completing the worksheets. Each jurisdiction on the list should ensure the information below is accurate and include any updates with the completed worksheet forms.

- Arroyo Grande and Grover Beach (joint Multi-Jurisdictional Local Hazard Mitigation Plan 2015, includes Lucia Mar Unified School District, South San Luis Obispo County Sanitation District)
- Morro Bay (Local Hazard Mitigation Plan 2006)
- Paso Robles (Local Hazard Mitigation Plan 2016)
- Pismo Beach (Local Hazard Mitigation Plan 2015)
- San Luis Obispo (Local Hazard Mitigation Plan 2014)
- San Luis Obispo County Flood Control and Water Conservation District (Participant in San Luis Obispo County Multi-Jurisdictional Local Hazard Mitigation Plan 2014)
- Oceano Community Services District (Draft Local Hazard Mitigation Plan 2018)

Data collection worksheets or edits to respective sections of San Luis Obispo County's Hazard Mitigation Plan are due on February 28th, 2019 to Jeff Brislawn (contact information below).

PROJECT CONTACTS

Jeff Brislawn Project Manager Wood Environment & Infrastructure Solutions, Inc	Jillian Ferguson SLO County Department of Planning & Buildings Long Range Planning Division
Phone: (303) 704-5506	Phone: (805) 781-1391
Email: jeff.brislawn@woodplc.com	Email: jfergusong@co.slo.ca.us

Multi-jurisdictional Hazard Mitigation Plan Update Guidance

1. Attend plan update meetings of the countywide HMPC.
2. Reconvene a mitigation planning subcommittee for your jurisdiction
 - a. Include departments such as planning, engineering, public works, GIS, police, fire, etc. as applicable
 - b. Document any meetings with sign in sheets (use blank template attached)
3. Review the Hazard Identification section of the County's 2014 plan. If applicable, review your jurisdiction's Hazard Identification section in the previous LHMP.
 - a. Identify hazard impacts to your jurisdiction since 2014 (Use historic hazard event worksheet to provide details, or collect related reports, articles or memos with damage amounts, damage assessment reports etc.)
 - b. Identify any new hazard studies or plans – send electronic versions (preferred if available), web link, or hardcopies to County HMP coordinator
4. Review the Vulnerability Assessment in the County's 2014 plan. If applicable, review your jurisdictions Vulnerability Assessment section in the previous LHMP.
 - a. Review the discussion on potential losses and note where you may have more specific information on past losses or potential for future losses specific to your jurisdiction. *Note: Wood will be re-doing the flood, earthquake and wildfire analyses based on current countywide GIS datasets. A recent sea level rise study and vulnerability assessment will also be incorporated and inform the coastal erosion section.*
5. Review the Capabilities Assessment in the County's 2014 plan and (if applicable) in your jurisdictions previous plan.
 - a. Consider existing capabilities your jurisdiction has in place.
 - b. Use the attached worksheets to provide updated or new information.
 - c. **For jurisdictions with an existing LHMP:** Note any changes in hazard significance or reduction in vulnerability through the implementation of mitigation projects such as defensible space, stormwater improvements, public education efforts, etc.
 - d. Note any changes in development trends since 2014. Provide an estimate of future trends (building types and counts).
 - e. Send Worksheets to Jeff Brislawn at Wood and notify the County HMP coordinator by **February 28th**.

6. Review the County's Mitigation Action Plan summary table in section 8.3. If applicable, review your jurisdiction's Action Plan.
 - a. Provide updates to the details of the project, where applicable
 - b. Note any changes in priority
 - c. Provide a status update on each project. Indicate what projects are ongoing, completed, deleted or deferred. If completed, was it successful? Did the project help prevent losses from an event, or has it not been tested yet? If it has not been completed indicate reason why (e.g. lack of funding, other priorities etc.). *A worksheet and template will be provided to facilitate this, with due date TBD.*
 - d. Consider ideas for new projects for your jurisdiction. These can be projects that may be in the works already but not captured in the plan or that may have become a priority following recent disaster declarations. These will be discussed at a future HMPC meeting. *A worksheet and template will be provided for new projects, and for those projects to be carried forward from the existing plan, with due date TBD.*
7. Review the County's Plan Implementation and Maintenance section of the 2014 plan. If applicable, review your jurisdiction's plan for implementation and maintenance.
 - a. Review this section for compliance; If this process was followed (e.g. via annual reviews) please provide details. If not, provide specific details to actual implementation and maintenance process over past 5 years.
 - b. Note any updates/efforts to incorporate this plan into existing planning mechanisms or opportunities to do so in the future **(Important) Note:** For jurisdictions without a previous LHMP, consider ways your jurisdiction may incorporate hazard information into existing planning mechanisms and government operations.
 - c. Note any continued public involvement (Wood will document meetings specific to the plan update). **Note:** For jurisdictions without a previous LHMP, consider ways your jurisdiction may involve the public in this planning process.
8. Help advertise and coordinate public meetings where applicable
9. Provide documentation of all meetings to County HMPC coordinator
10. Review and comment on the updated plan
11. When plan receives conditional approval from FEMA, re-adopt the plan
12. Continue to implement the plan!

Information Sources

The following are possible sources of information to assist with updating the plan:

- General Plans, specifically Safety Element
- Emergency Operations Plans
- Emergency Action Plans for dams
- Incident logs/After Action reports
- Damage Assessment reports
- Drought Plans
- Evacuation Plans
- Recovery Plans
- Emergency Exercise Scenarios
- GIS databases
- Hazard specific plans:
 - Community Wildfire Protection Plans
 - Flood Hazard Mitigation Plans
 - Fire Safe plans
- Capital Improvement Plans
- Capital Facilities Plans
- Strategic plans
- Land Use Plans/Codes
- Local Building codes/regulations
- Climate adaptation plans and vulnerability studies

The Risk Assessment Process

The risk assessment process includes three components: hazard identification, vulnerability assessment, and capability assessment. Data needs and worksheets for each of the risk assessment components are included in this guide. Use these worksheets to evaluate your jurisdiction's current vulnerability to natural hazards. Refer to the County's existing plan (Chapter 5) or, if applicable, your jurisdiction's existing plan first. The intent is to identify any changes in the significance or risks to these hazards as they pertain to your jurisdiction.

San Luis Obispo County Local Hazard Mitigation Plan

Worksheet #1: Hazard Identification Update

Name of Department/Jurisdiction: _____

Use this worksheet to identify possible hazards that may impact your jurisdiction. Hazards currently identified in the County plan are listed. Please rank according to the guidelines that follow the table. Use copies of Worksheet #2: Historic Hazard Event to provide evidence to justify your conclusions.

Hazard	Frequency of Occurrence	Hazard Extent	Potential Magnitude	Significance	Hazard Map? (Paper/GIS/Source)
Adverse weather*					
Agricultural pests and plant diseases					
Biological agents					
Coastal erosion					
Coastal flooding and inundation					
Dam Failure					
Drought					
Earthquakes					
Flooding					
Debris flows					
Hazardous trees					
Land subsidence					
Liquefaction					
Radon hazards					
Sea level rise					
Seiches					
Slope stability (landslide)					
Tsunamis					
Wildfire					
Other:					
*Adverse Weather in the SLO Plan Includes dust storms, extreme temperatures, fog, hail, heavy rains, lightning, tornadoes, windstorms, and winter storms; drought also included but broken out separately in this worksheet.					

Frequency of Occurrence:

Highly Likely: Near 100% probability in next year.
Likely: Between 10 and 100% probability in next year or at least one chance in ten years.
Occasional: Between 1 and 10% probability in next year or at least one chance in next 100 years.
Unlikely: Less than 1% probability in next 100 years.

Hazard Extent:

Limited: Less than 10% of planning area
Significant: 10-50% of planning area
Extensive: 50-100% of planning area

Potential Magnitude:

Catastrophic: Multiple deaths, complete shutdown of facilities for 30 days or more, more than 50% of property is severely damaged
Critical: Multiple severe injuries, complete shutdown of facilities for at least 2 weeks, more than 25% of property is severely damaged
Limited: Some injuries, complete shutdown of critical facilities for more than one week, more than 10 percent of property is severely damaged
Negligible: Minor injuries, minimal quality-of-life impact, shutdown of critical facilities and services for 24 hours or less, less than 10 percent of property is severely damaged.

Significance (your subjective opinion): Low, Medium, High

Prepared by: _____

Phone: _____

Email: _____

San Luis Obispo County Local Hazard Mitigation Plan Worksheet #2: Historic Hazard Event

Name of Department/Jurisdiction: _____

Please fill out one sheet for each significant hazard event with as much detail as possible. Attach supporting documentation, photocopies of newspaper articles, or other original sources.

Type of event	
Nature and magnitude of event	
Location	
Date of event	
Injuries	
Deaths	
Property damage	
Infrastructure damage	
Crop damage	
Business/economic impacts	
Road/school/other closures	
Other damage	
Insured losses	
Federal/state disaster relief funding	
Opinion on likelihood of occurring again	
Source of information	
Comments	

Prepared by: _____

Phone: _____

Email: _____

San Luis Obispo County Local Hazard Mitigation Plan

Worksheet #3: Vulnerability Assessment

Name of Department/Jurisdiction: _____

The purpose of this worksheet is to assess the vulnerable buildings, populations, critical facilities, infrastructure, and other important assets in your community by using the best available data to complete the table and questions that follow. Use the table on the next page to compile a detailed inventory of specific assets at risk including critical facilities and infrastructure; natural, cultural, and historical assets; and economic assets as defined below. Attach supporting documentation, such as photographs, reports, or plans if possible. In the hazard specific column of the asset inventory table, indicate if there is a specific hazard to which the asset is at risk.

Critical Facilities

Critical Facilities must remain operational during any major disaster and be designed, located, and constructed accordingly. FEMA's Hazus-MH loss estimation software uses the following three categories of critical assets. 'Essential facilities' are those that if damaged would have devastating impacts on disaster response and/or recovery. 'High potential loss facilities' are those that would have a high loss or impact on the community. Transportation and lifeline facilities are third category of critical assets; examples are provided below.

Essential Facilities	High Potential Loss Facilities	Transportation and Lifeline
<ul style="list-style-type: none">▪ Hospitals and other medical facilities▪ Police stations▪ Fire station▪ Emergency Operations Centers	<ul style="list-style-type: none">▪ Power plants▪ Dams/levees▪ Military installations▪ Hazardous material sites▪ Schools▪ Shelters▪ Day care centers▪ Nursing homes▪ Main government buildings	<ul style="list-style-type: none">▪ Highways, bridges, and tunnels▪ Railroads and facilities▪ Bus facilities▪ Airports▪ Water treatment facilities▪ Natural gas facilities and pipelines▪ Oil facilities and pipelines▪ Communications facilities

Natural, Cultural, and Historical Assets

Natural resource assets may include wetlands, threatened and endangered species, or other environmentally sensitive areas. Historical assets include state and federally listed historic sites.

Economic Assets

Economic assets at risk may include major employers or primary economic sectors, such as agriculture, whose losses or inoperability would have severe impacts on the community and its ability to recover from disaster.

Asset Inventory

[illegible]

*EI: Essential Infrastructure; VF: Vulnerable Facilities; HM: Hazardous Materials Facilities; NA: natural assets

Additional Vulnerability Questions

Describe growth and development trends and future growth areas in your jurisdiction and how they relate to hazard areas and vulnerability concerns/issues.

Review the mitigation actions in your jurisdiction's previous hazard mitigation plan. Indicate what projects have been completed or are ongoing and describe how vulnerability has changed (or not) as a result of implementing successful mitigation actions. For jurisdictions without a previous plan: Consider ideas for new projects for your jurisdiction. These can be projects that may be in the works already or that may have become a priority following recent disaster declarations. These will be developed further in future planning workshops.

Prepared by: _____

Phone: _____

Email: _____

San Luis Obispo County Local Hazard Mitigation Plan Worksheet #4: Capability Assessment

Name of Department/Jurisdiction: _____

Capabilities are the programs and policies currently in use to reduce hazard impacts or that could be used to implement hazard mitigation activities. Please complete this worksheet and provide supporting documentation if possible.

Regulatory

The following planning and land management tools are typically used by local jurisdictions to implement hazard mitigation activities. Please indicate which your jurisdiction has in place. If your jurisdiction does not have this capability or authority, please indicate if a higher level of government has the authority. Also use the comments column to indicate how we can obtain a copy of the plan or document (e.g. available on the web (include address), will e-mail or send by mail).

Regulatory Tool (ordinances, codes, plans)	Yes/No	Comments
General Plan		
Zoning ordinance		
Subdivision ordinance		
Growth management ordinance		
Floodplain ordinance		
Other special purpose ordinance (stormwater, steep slope, wildfire)		
Building code		
Fire department ISO rating		
Erosion or sediment control program		
Stormwater management program		
Site plan review requirements		
Capital improvements plan		
Economic development plan		
Local emergency operations plan		
Other special plans		
Flood insurance study or other engineering study for streams		
Elevation certificates (for floodplain development)		
Other		

Administrative/Technical

Identify the technical and personnel resources responsible for activities related to hazard mitigation/loss prevention within your jurisdiction. For smaller jurisdictions without local staff resources, if there are public resources at the next higher-level government that can provide technical assistance, please indicate so in the comments column.

Personnel Resources	Yes/No	Department/Position	Comments
Planner/engineer with knowledge of land development/land management practices			
Engineer/professional trained in construction practices related to buildings and/or infrastructure			
Planner/engineer/scientist with an understanding of natural hazards			
Personnel skilled in GIS			
Full time building official			
Floodplain manager			
Emergency manager			
Grant writer			
Other personnel			
GIS Data Resources (Hazard areas, critical facilities, land use, building footprints, etc.)			
Warning Systems/Services (Reverse 9-11, cable override, outdoor warning signals)			
Other			

Additional Capabilities Questions

<p>Does your community have any hazard-related certifications, such as Storm Ready certification or Firewise Communities certification?</p>	
<p>Describe any past or ongoing public education or information programs, such as for responsible water use, earthquake or fire safety, household preparedness, or environmental education.</p>	
<p>Describe any other past or ongoing projects or programs designed to reduce disaster losses. These may include projects to protect critical facilities.</p>	
<p>As a result of completing the Capability Assessment (worksheet #4) above, are there any opportunities to expand upon or improve existing capabilities?</p>	

Prepared by: _____

Phone: _____

Email: _____

SIGN-IN SHEET - SAN LUIS OBISPO COUNTY
MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN UPDATE PROJECT

Jurisdiction:

Date:**Time:****Location:**

Meeting Purpose:

[illegible]

From: Jillian H. Ferguson <jferguson@co.slo.ca.us>
Sent: Tuesday, January 29, 2019 11:17 AM
To: Jay Johnson; Jeffery Legato; Joe Guzzardi; Scott Milner; Dave Flynn; Kate Ballantyne; Bryan Iwamoto; Francisco Pares; Mladen Bandov; Lynda Auchinachie; Dan Turner; slieberman_fivecitiesfire.org; Camilla Karamanlis; mdowning_arroyogrande.org; Tom Peterson; Casey Bryson; jpeters_gbpd.org; sknuckles_morrobayca.gov; Matthew Vierra; jstornetta_prcity.com; mgruver@pismobeach.org; Aggson, Keith; Maggio, Rodger; BHill_slocity.org; Read, Chris; Blattler, James; ,; rkoon_cayucosd.org; kellys@portsanluis.com; hagemann.associates_gmail.com; gm@groundsquirrelhollowcsd.org; scott@heritageranchcsd.com; scott@heritageranchcsd.com; Renee Osborne; Mlglesias_ncsd.ca.gov; Kelly Dodds; cmurguia@graceenviro.com; Nicole Miller; 'Carey Casciola'; jbriltz_templetoncsd.org; Chief_templetoncsd.org; kentopping_aol.com; thomas.smet@dsh.ca.gov; Phillip.koziel@dsh.ca.gov; wsiembie_calpoly.edu; Steck, Jason@CDCR; david.pierson.usna@gmail.com
Cc: Karen Nall; Brislawn, Jeff P; Gira, Daniel
Subject: Thank you for your attendance
Attachments: SLO HMP Update Kickoff Agenda.docx; SanLuisObispo_County_KickOff_MeetingPres1-25-19.pdf; SLO County HMP update Workbook.doc; 2019 HMP Plan section review analysis.docx

Good morning –

Thank you for attending the Multi-Jurisdictional Hazard Mitigation Plan Update Kick-off Meeting. Please find the following attachments:

- Meeting agenda
- PDF of meeting presentation
- SLO County HMP update Workbook.doc – (This handout is required for participating jurisdictions – Cities, CSD's and Special Districts)
- 2019 Plan Section Review and Analysis

Please expect a meeting summary shortly. Thanks again for your participation. Please feel free to call or email me with any questions or comments.

Jillian Ferguson

Planner, Long Range Division

(p): 805-781-1391

jferguson@co.slo.ca.us

COUNTY OF SAN LUIS OBISPO

DEPARTMENT OF PLANNING & BUILDING

**SAN LUIS OBISPO COUNTY MULTI-JURISDICTIONAL HAZARD
MITIGATION PLAN**

2019 UPDATE

MEETING #2 Risk and Goals

Tuesday, March 19, 2019

9:00 – noon

**New County Government Center Rm 161
1055 Monterey St., San Luis Obispo, CA 93408**

- 1. Introductions**
- 2. Review of the Planning Process**
- 3. Review of Identified Hazards**
- 4. Hazards Assessment Update – Highlights of Findings by Hazard**
- 5. Capability Assessment Update Discussion**
- 6. Updating Goals for the Mitigation Plan**
- 7. Planning for Public Involvement Update**
- 8. Update on Multi-Jurisdictional Planning Information Needs**
- 9. Questions and Answers/Adjourn**

SIGN-IN SHEET
SAN LUIS OBISPO COUNTY MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN UPDATE PROJECT
HMPC #2 – Risk and Goals

Tuesday, March 19, 2019 9:00 AM - Noon

New County Government Center RM 161 1055 Monterey St. San Luis Obispo, CA

Name	Jurisdiction/Agency/Dept	Title	Phone	E-mail
JOHN PETERS	CITY OF GREYER BEACH / PD	CHIEF	805-473-4507	JPETERS@GMAIL.COM
Jonathan Stornetta	City of Paso Robles	Fire Chief	805-227-7560	jstornetta@preity.com
DAVID PIERSON	CAMBRIA	CCSD BOARD.	805-203-5628	dpierson@CambriaCSD.org.
Rodger Maggic	SLO City Fire	Fire Marshal	805-781-7386	rMaggic@slocity.org
SCOTT DUFFIELD	HERITAGE RANCH CSD	GENERAL MANAGER	805 227 6230	scott@heritageranchcso.ca.gov
Nessa Garcia	Cayucos Elementary	School Nurse/safety coordinator	805 909-0340	ngarcia@cayucoschool.org
JOE GUZZARDI	SLO CO OFS	EMERGENCY SVCS MGR	805-781-5454	JGUZZARDI@CO.SLO.CA.US
Kate Ballantyne	SLO PW	Deputy Director	805 781 5458	kballantyne@co.slo.ca.us.
Renee Osborne	Los Osos	GM	528 9379	rosborne@lososocsd.org
Tom Peterson	ATASCADERO Fire	Fire Marshal	(805) 538-9196	tompeterson@atascadero.org
Camilla Karamanlis	Arroyo Grande	Program Analyst	805 709 5354	ckaramanlis@arroyogrande.org
Casey Bryson	Atascadero	Fire Chief	805 801 1013	cbryson@atascadero.org

New County Government Center RM 161 1055 Monterey St. San Luis Obispo, CA

[illegible]

New County Government Center RM 161 1055 Monterey St. San Luis Obispo, CA

[illegible]

San Luis Obispo County
Multi-Jurisdictional Hazard Mitigation Plan Update
Risk Assessment and Goals Meeting Summary

March 19, 2019

9:00 AM– 12 PM

County Government Center Rm 161
1055 Monterey St., San Luis Obispo, CA

Introductions and Opening Remarks

Jillian Ferguson with County Planning began the meeting with welcoming remarks and introduced Jeff Brislawn of Wood, the consulting firm hired to facilitate the plan development process. Approximately twenty-four persons were present and documented on a sign in sheet.

Review of Mitigation, Disaster Mitigation Act (DMA) Requirements, and the Planning Process

Following self introductions by attendees a PowerPoint presentation was presented by Jeff Brislawn. Jeff reviewed the planning process being followed and discussed the project status. Jeff emphasized that jurisdictions that have not yet submitted information requested in the planning workbook to do so as soon as possible. This is particularly important for new jurisdictions to the Multi-Jurisdictional Hazard Mitigation Plan as the workbook will provide a basis for the development of jurisdictional annexes.

Risk Assessment Presentation and Discussion

Jeff outlined the general risk assessment requirements before beginning a detailed discussion of each hazard. He presented highlights on each hazard included in the updated risk assessment chapter of the plan. Refer to the San Luis Obispo County HMP Risk Assessment PowerPoint presentation for specific details on each hazard and a handout summarizing hazard significance.

Additional insight and details were learned during the risk assessment conversation among participants. Highlights of the discussion are noted by hazard in the table below.

Hazard or Topic	Meeting Discussion
Adverse Weather: Heavy Rain, Fog, Hailstorm, Thunderstorm, Tornado, Windstorm, Extreme Heat	<ul style="list-style-type: none"> Several sub-hazards of Severe Weather were discussed.
Agricultural Pest and Disease	<ul style="list-style-type: none"> No comment
Coastal Storms/ Coastal Erosion/Sea Level Rise	<ul style="list-style-type: none"> Dan Gira from Wood Santa Barbara's office presented the issues, noting that the sea level rise projections have been changing, generally with higher depths sooner than originally anticipated.
Biological Agents	<ul style="list-style-type: none"> A comment about if typhus had been considered was raised. There have been recent outbreaks in LA with homeless populations being more vulnerable. Statewide hospital medical exercise after action reports could be a source for additional information on risks, vulnerabilities, and ideas for strategies
Dam Incidents	<ul style="list-style-type: none"> Some HMPC members suggested the count of properties and population at risk seemed low and provided examples of several dams. Jeff noted this was only accounting for residential population and should be considered a low estimate. An economic loss study for the Whale Rock Dam has been done It was noted that the long-term loss of the water in the reservoir from a failure event would also have economic impacts.
Drought and Water Shortage	No comment
Earthquake	<ul style="list-style-type: none"> While the Diablo Canyon plant is determined to withstand earthquake shaking, the power lines from the plant could be a concern. The transcontinental fiber optic line was noted as a concern, as well as microwave communication sites on mountain tops. State water project pipelines should be noted as a vulnerability. In addition to high pressure gas and petroleum pipelines to Kern County that cross the San Andreas fault
Flood	<ul style="list-style-type: none"> Levee failure has been added in the flood hazard profile No comment
Landslides and Debris Flow	<ul style="list-style-type: none"> Jeff asked for recent incidents to note in the plan. Avila Beach Drive road was noted as a problem area where the County had done repairs and improvements. A dorm at Cal Poly was affected (Fremont) In Cambria the Cambria Community Healthcare District facility was impacted by a landslide. County roads along Santa Rosa Creek

Hazard or Topic	Meeting Discussion
	<ul style="list-style-type: none"> • Highway 41 between Morro Bay and Atascadero has been closed periodically due to rockslides • Impacts to high mountain roads in the Poso and Lopez areas has affected fire response, Rd 166 also • City of Atascadero has had some impacts • San Simeon CSD also • Some areas near the Hearst property has also seen movement
Subsidence	<ul style="list-style-type: none"> • Sinkholes near the hospital have occurred due to groundwater pumping • San Simeon – sinkhole problem near hotel parking lot • Subsidence also is to be addressed in Groundwater Sustainability Plans
Tsunami	<ul style="list-style-type: none"> • The population in Pismo and Grover Beach area swell with beachgoing tourists. • The Oceano Dunes state park has as much as 10,000 to 40,000 visitors on busy summer weekends and holidays. Visitors may not heed warnings or know where to go for safety. • Railroad could be impacted
Wildfire	<ul style="list-style-type: none"> • The HMPC said that the SRA does not account for ember throw, which can cause structure fires a half mile to a mile beyond the mapped hazard zones. A limitation of the LRA mapping is that only Very High zones are modeled. The Moderate zones should be accounted for also in the countywide assessment. Jeff said that the updated HIRA does included Moderate also. • Another limitation of the SRA mapping is federal lands are not assessed; this should be noted in the plan. • The Chimney Fire should be noted as a major fire • It should be noted • A comment was made that wildfire mitigation effort has been constrained by threatened and endangered species protections; a protected snail in the Los Osos area was specifically mentioned. • A side-bar conversation with the Fire Safe Council representative noted that there should be mapping of the fire hazard with tree mortality overlaid on it.
Development trends	<ul style="list-style-type: none"> • A comment was raised about how state mandates to develop additional housing and how that could be in potentially creating additional exposure to hazards. This should be noted in the growth and development trends discussion.

Jeff noted that some additional work remains to finish the assets summary in particular the critical facility analysis. He encouraged review and feedback on the draft HIRA on the Google Drive with comments by April 5th.

Capability Assessment Update

Jeff noted that the capability assessment update is one of the next steps in the planning process. Jeff noted that FEMA reviewers are paying particular attention to the capability assessments in plan updates. Specifically, they want to see that each jurisdiction looked at and discuss opportunities to expand or improve mitigation capabilities as part of the update process. Mitigation capabilities include administrative, technical and financial.

Plan Goals Update

Another next step will be updating the plan's goals. Jeff provided a handout that summarized the goals and objectives of the County HMP and the jurisdictional HMPs, as well as the 2018 State of California HMP goals. Jeff noted how some of the goals are hazard specific, and some are more general. He stated that the update provides an opportunity to review the goals to see if they are still valid, comprehensive and reflect current priorities and the updated risk assessment. Jeff encouraged the jurisdictions to share the goal statements with their local planning teams prior to the next meeting to discuss if any changes are needed. Jurisdictions can have their own specific goals or utilize the County's goals.

The group will revisit the goals for finalization at the beginning of the next meeting.

Mitigation Action Strategy update needs

Jeff noted that the mitigation action strategy will be revisited moving forward and will be the focus of the next HMPC meeting. Jeff recommended that the existing mitigation actions be reviewed by the HMPC as a status report will need to be completed for each action. Jeff will send out a worksheet to help facilitate the status reporting prior to the next meeting. There will be an opportunity to develop new mitigation actions for the plan as well. These will be identified at the next meeting.

Update on Public Involvement Activities/public meeting.

An online public survey has been developed and advertised as part of the public process with approximately 30 respondents thus far. The link will be provided for distribution by email and posting on jurisdiction websites. Another public meeting will occur in late April during the same timeframe as the next HMPC meeting with details forthcoming.

Plan Timeline/Next steps

The next and final two HMPC planning meeting will be during the week of April 22nd. The group preferred having two shorter meetings versus one longer one. The purpose of the next meetings are to update the capability assessment and the mitigation strategy. This will include development of new mitigation actions for the plan and participating jurisdictions. Once the specific dates have been identified, a calendar update will be sent out. The meeting materials will also be shared electronically, including the presentation and handouts. A project schedule was also requested to be sent via email.

The meeting adjourned at noon.

SLO Multi-jurisdictional Hazard Mitigation Plan Goals Update Worksheet – 3-19-19

San Luis Obispo County Local Hazard Mitigation Plan – 2014 Goals and Objectives

Goal 1 – Promote understanding and support for hazard mitigation by key stakeholders and the public within the County of San Luis Obispo.

- Objective 1.1 – Educate key stakeholders and the public to increase awareness of hazards and opportunities for mitigating hazards

Goal 2 – Ensure that future development is protected from natural disasters.

- Objective 2.1 – Limit new development in hazard areas, and as permissible, build to standards that will prevent or reduce damage.

Goal 3 – Build and support local capacity and commitment to minimize the County of San Luis Obispo’s vulnerability to potential hazards through collaboration with the incorporated cities.

- Objective 3.1 - Improve existing capabilities to manage emergency situations
- Objective 3.2 - Enhance the safety of residents, students and staff within the community
- Objective 3.3 - Assure that at-risk populations and those with access and functional needs (AFN) are addressed in all plans and procedures

Goal 4 - Minimize the level of damage and losses to people, existing and future critical facilities and infrastructure due to flooding

- Objective 4.1 - Enhance the ability of community assets, particularly critical facilities, located in the 100-year floodplain to handle existing and projected flood waters

Goal 5 - Minimize the level of damage and losses to people, existing and future critical facilities and infrastructure due to wildland fires

- Objective 5.1 - Develop a comprehensive approach to reducing the level of damage and losses due to wildland fires through resilient community and critical infrastructure design, vegetation management, weed abatement, ignition resistant construction, code enforcement, GIS mapping, and planning processes

Goal 6 - Minimize the level of damage and losses to people, existing and future critical facilities and infrastructure due to geological events (earthquakes, landslides, and liquefaction)

- Objective 6.1 - In order to better protect life and property, develop a more accurate, comprehensive series of countywide GIS geology maps and data sets and continue response efforts
- Objective 6.2 - Follow-up on infrastructure vulnerabilities indicated in the updated Diablo Canyon Earthquake Evacuation Scenario Plan; in particular bridges susceptible to earthquake damage on key evacuation routes

Goal 7 - Minimize the level of damage and losses to people, existing and future critical facilities and infrastructure due to tsunami events

- Objective 7.1 - Develop a comprehensive approach to reducing the level of damage and losses due to tsunamis through improved policies, procedures, training, and evacuation planning

Goal 8 - Minimize human morbidity and mortality as a result of biological agent threats

- Objective 8.1 - Curtail the entry and spread of infectious diseases within San Luis Obispo County

Goal 9 - Minimize the extent of damage and destruction to crops, farm animals, humans, and existing and future critical facilities as a result of agricultural pests and disease

- Objective 9.1 - Curtail the entry of harmful agricultural pests into San Luis Obispo County
- Objective 9.2 - Quickly detect and eradicate pathogenic pests within the County. When eradication is not feasible, minimize pest spread

Goal 10 - Adopt strategies to enable the County to prepare for and adjust to impacts of climate change through collaboration with the incorporated cities

- Objective 10.1 - Curtail the harmful effects of climate change by identifying, assessing and preparing for impacts. Coordinate with the incorporated cities to implement strategies with regional significance such as energy efficiency retrofit projects

City of San Luis Obispo Local Hazard Mitigation Plan - 2014

Goal 1 - Cultivate a disaster-resistant community through implementation of risk reduction measures and increased public awareness to prepare for, respond to, and recover from natural and human-caused hazard events.

Goal 2 - Reduce the severity of damage and losses due to natural and human-caused hazards.

City of Atascadero Local Hazard Mitigation Plan - 2014

Goal 1 – Increase public awareness of current drought conditions

Goal 2 – Minimize the loss of property and life as the result of a windstorm

Goal 3 – Reduce the possibility of damage and losses due to dam failure

Goal 4 – Reduce the possibility of damage and losses due to earthquake

Goal 5 – Minimize property damage as a result of expansive unstable soil conditions

Goal 6 – Reduce the possibility of damage and losses due to floods

Goal 7 – Reduce the possibility of damage and losses due to land subsidence

Goal 8 – Reduce the possibility of damage and losses due to wildland fires

City of Paso Robles Local Hazard Mitigation Plan – 2016

Goal 1 – Minimize loss of life, injury and damage to property, the economy, and the environment from the hazards identified in the 2016 LHMP

Goal 2 – Build and enhance local mitigation capabilities to reduce the hazards identified in the 2016 LHMP. This will help ensure individual safety, reduce damage to public buildings and guarantee continuity of emergency services

City of Morro Bay Local Hazard Mitigation Plan - 2006

Goal 1 – Promote disaster-resistant future development

Goal 2 – Promote understanding and support for hazard mitigation by key stakeholders and the public within the City of Morro Bay

Goal 3 – Build and support local capacity and commitment to minimize the City of Morro Bay's vulnerability to potential hazards

Goal 4 – Minimize the level of damage and losses to people, existing and future critical facilities and infrastructure due to flooding

Goal 5 – Minimize the level of damage and losses to people, existing and future critical facilities and infrastructure due to tsunamis

Goal 6 – Minimize the level of damage and losses to people, existing and future critical facilities and infrastructure due to wildland fires

Goal 7 – Minimize the level of damage and losses to people, existing and future critical facilities and infrastructure due to earthquakes

Goal 8 – Minimize the level of damage and losses to people, existing and future critical facilities and infrastructure due to accidental spills and releases of hazardous materials

Goal 9 – Minimize the level of damage and losses to people, existing and future critical facilities and infrastructure due to biological agent threats

City of Pismo Beach Local Hazard Mitigation Plan – 2014

Goal 1 – Promote disaster-resistant development

Goal 2 – Build and support local capacity to enable the public to prepare for, respond to and recover from disasters

Goal 3 – Reduce the possibility of damage and losses due to bluff/erosion failure

Goal 4 – Reduce the possibility of damage and losses due to coastal storm

Goal 5 – Reduce the possibility of damage and losses due to dam failure

Goal 6 – Reduce the possibility of damage and losses due to earthquake

Goal 7 – Reduce the possibility of damage and losses due to flood

Goal 8 – Reduce the possibility of damage and losses due to hazardous material events

Goal 9 – Reduce the possibility of damage and losses due to landslide

Goal 10 – Reduce the possibility of damage and losses due to tsunami

Goal 11 – Reduce the possibility of damage and losses due to wildland fire

Arroyo Grande Multi-Jurisdictional Local Hazard Mitigation Plan – 2014

City of Arroyo Grande

Goal 1 - Minimize the level of damage and losses due to flooding

Goal 2 - Minimize the level of damage and losses due to earthquakes

Goal 3 - Minimize the level of damage and losses due to wildland and structure fires

Goal 4 - Minimize impacts to the community from dam inundation events

South San Luis Obispo County Sanitation District

Goal 1 – Minimize earthquake damage and losses due to earthquakes

Goal 2 – Minimize flooding damage and losses due to flooding

Goal 3 – Minimize the level of losses and damage due to fires

Goal 4 – Minimize tsunami impacts to South San Luis Obispo County Sanitation District facilities

Lucia Mar Unified School District

Goal 1 – Minimize earthquake damage and losses to School District facilities due to earthquake

Goal 2 – Minimize damage due to flooding

Goal 3 – Minimize damage due to fires

Goal 4 – Minimize potential tsunami impacts to Lucia Mar Unified School District facilities

California State Hazard Mitigation Plan – 2018

Goal 1 – Significantly reduce life and loss

Goal 2 – Minimize damage to structures and property, and minimize interruption of essential services and activities

Goal 3 – Protect the environment

Goal 4 – Promote community resilience through integration of hazard mitigation with public policy and standard business practices

LHMP Public Workshop #1

To promote the upcoming Local Hazard Mitigation Plan Update's First Public Workshop, County staff reached out to local media outlets to inform the public of the opportunity to learn more about the LHMP update and help staff identify risks, hazards and vulnerabilities. Posts were created on the following community calendars:

KSBY
KCBX
KEYT/ KCOY
New Times/Santa Maria Sun
Paso Robles Daily News
Santa Maria Times
Tribune
Cambrian News
Pacific Coast Business Times

County-wide stakeholders were identified, and invites were also sent to:

Cal Poly MCRP Professors
Cambria CSD
SLO Fire Safe Council
Associate Warden CMC
Department of State Hospitals
Department of State Hospitals
Xolon Salinan Tribe
Tenet Health
Slo Cog
Coastal Commission
Coastal Commission
Head of Safety Committee Cayucos
Safety and Emergency Plans Templeton
Paso School District
San Luis Coastal Unified School District
Assistant Superintendent, Lucia Mar Schools

The LHMP Workshop Flyer, venue location and time, contact information, survey hyperlink, and a brief description of the event were included in the posts.

SLO County Local Hazard Mitigation Plan Update Public Workshop

Calling all neighbors and community members! Join us for a public workshop Tuesday, March 19th to learn about the SLO County Local Hazard Mitigation Plan (LHMP) and help staff identify hazards, vulnerabilities and assets at risk in our community. Please take a short survey to assist staff in updating the LHMP! <https://www.surveymonkey.com/r/SLOHMPUpdate>

SLO COUNTY LOCAL HAZARD MITIGATION PLAN UPDATE PUBLIC WORKSHOP

**IDENTIFY HAZARDS, VULNERABILITIES, AND
ASSETS AT RISK**

March 19, 2019 | 5:30 PM to 7:30 PM
995 Palm Street, San Luis Obispo
(San Luis Obispo Library)

Take our brief survey:

<https://www.surveymonkey.com/r/SLOHMPupdate>



wood.

**Snacks will be
provided!**





Public Workshop Agenda

Date: 19 March 2019
5:30 PM – 7:30 PM

Meeting at: San Luis Obispo Library
995 Palm Street
San Luis Obispo, CA 93403

Project: San Luis Obispo County Hazard Mitigation Plan Update

Subject/Purpose

The purpose of the workshop is to introduce the Disaster Mitigation Act of 2000 and the hazard mitigation planning process for San Luis Obispo County's Hazard Mitigation Plan update. The HMP is intended to identify hazards, vulnerabilities, and assets at risk, and ways to reduce impacts through long-term sustainable mitigation projects. The intent of the workshop is also to answer questions and gather public input for the plan update.

1. Introductions
2. Mitigation Planning and the Disaster Mitigation Act
3. Objectives of the Multi-Jurisdictional Hazard Mitigation Plan Update
4. Community Outreach
5. Online Survey
6. Hazard Identification and Risk Assessment
7. Review Goals for the LHMP
8. Discuss Mitigation Action Strategies
9. Schedule and Next Steps
10. Questions and Answers

Public Notice Ad

Public Meeting on the San Luis Obispo County Hazard Mitigation Plan Update

Location: San Luis Obispo Library, 995 Palm Street, San Luis Obispo, CA 93403

Tuesday, March 19th, 2019 at 5:30-7:30 pm.

In recent months California and the U.S. has experienced significant natural disasters. Would you like to learn more about hazards that could impact San Luis Obispo County including floods, dam failures, wildfires, drought, and other hazards? A public forum to discuss these hazards, and how the County is proposing to mitigate or lessen their impact, will be held March 19th. The San Luis Obispo County Hazard Mitigation Plan is being updated under the guidance of a multi-jurisdictional Hazard Mitigation Planning Committee (HMPC) with assistance from a consultant and a FEMA grant. Attendees will learn more about the hazards and strategies to mitigate them at this meeting. Public input is also being sought on these same topics at this meeting.

A short public survey related to the plan update can be accessed at:

<https://www.surveymonkey.com/r/SLOHMPupdate>

COMMENT CARD

San Luis Obispo County Hazard Mitigation Plan Update: Public Workshop – March 19, 2019

Please leave a comment related to the County's Hazard Mitigation Plan. Please provide your contact info if you would like to receive ongoing updates and information related to the HMP by email, phone, or mail.

Name (optional): JOHN THORNTON

Email (optional): john@pasoroblesradioranch.com

Phone Number (optional): 805-610-6000

Mailing Address (optional): PO BOX 1110, PASO ROBLES 93447-1110

Comment: CELL SITES AND OTHER TELECOMMUNICATIONS FACILITIES SHOULD BE CONSIDERED UNDER CRITICAL INFRASTRUCTURE. POLICE AND FIRE DEPARTMENTS RELY ON THIS SERVICE FOR THEIR MOBILE DATA TERMINALS AND THE PUBLIC RELIES ON CELL SITES TO PROVIDE COMMUNICATION TO FAMILY MEMBERS, TO 911, AND TO GET EMERGENCY INFORMATION. MANY CELL SITES ARE LOCATED IN HIGH FIRE DANGER AREAS OF THE COUNTY (HILLTOPS AND DENSE FOLIAGE AREAS). MOST SITES DO NOT HAVE BACK-UP GENERATORS. ALL CELL SITES SHOULD BE MAPPED AS CRITICAL INFRA. I AM AVAILABLE TO ANSWER QUESTIONS

Or fill out the brief Online Survey at: <https://www.surveymonkey.com/r/SLOHMPupdate>

Comment cards must be delivered to the comment box by the end of the Workshop.

If you have any questions, please contact Jillian Ferguson at 805-781-1391

jferguson@co.slo.ca.us

COMMENT CARD

San Luis Obispo County Hazard Mitigation Plan Update: Public Workshop – March 19, 2019

Please leave a comment related to the County's Hazard Mitigation Plan. Please provide your contact info if you would like to receive ongoing updates and information related to the HMP by email, phone, or mail.

Name (optional): DAVE GARTH

Email (optional): dave@davegarth.com

Phone Number (optional): 805 441-8448

Mailing Address (optional):

Comment: OTHER AGENCIES INVOLVED IN DISASTER RESPONSE
SLO CO OFFICE OF EMERGENCY SERVICE — GREGG RODRIGUEZ
SLO CO IT & RADIO SHOP — VAHRAH HAVANDJIAN
ARES/RACES — HAM RADIO

Or fill out the brief Online Survey at: <https://www.surveymonkey.com/r/SLOHMPupdate>

Comment cards must be delivered to the comment box by the end of the Workshop.

If you have any questions, please contact Jillian Ferguson at 805-781-1391
jferguson@co.slo.ca.us

COMMENT CARD

San Luis Obispo County Hazard Mitigation Plan Update: Public Workshop – March 19, 2019

Please leave a comment related to the County's Hazard Mitigation Plan. Please provide your contact info if you would like to receive ongoing updates and information related to the HMP by email, phone, or mail.

Name (optional): Don Dunkle

Email (optional): donjdunkle@gmail.com

Phone Number (optional):

Mailing Address (optional): SLO - 93401

Comment:

CERT - "Community Emergency Response Team"
↳ citizen oriented - volunteer
via City Police & Fire Dept.

City of Irvine - O.C. has an excellent well oiled program in place that could be modeled.

Presentation - Good info - I believe I misunderstood the objective of this presentation.

* Or fill out the brief Online Survey at: <https://www.surveymonkey.com/r/SLOHMPupdate>

Comment cards must be delivered to the comment box by the end of the Workshop.

If you have any questions, please contact Jillian Ferguson at 805-781-1391

jferguson@co.slo.ca.us

↳ Pre & Post
Hazard mitigation

SIGN-IN SHEET
SAN LUIS OBISPO COUNTY MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN UPDATE PROJECT
Public Workshop
March 19, 2019 5:30 – 7:30 PM
San Luis Obispo Library, 995 Palm Street, San Luis Obispo, CA

Name	Citizen or Organization	Community	E-mail (optional)
TIM MURPHY	SLO CO. DISTRICT ATTY	PASO ROBLES	
Scott Milner	SLO Co. OES	County of SLO	smilner@co.slo.ca.us
CHRISTHYRRING	Citizen	HALEY	crthyrring@gmail.com
JOHN THORNTON	"	PASO ROBLES	john@w6rr.com
JANE "	"	"	jane@w6rr.com
John Bonnet #	SLO ECC / ^{ARES} / DEL	Los Osos	jhba@uplus.net
DAVE GARTH	SLO ECC / ARES / RACES	SAN LUIS Obispo	dave@davegarth.com
Don Dunkle	Citizen	SLO	donjdunkle@gmail.com
* MIKE GRUVER	CITY OF PISMO BEACH	PISMO	mgruver@pismo-beach.org
William Siembieda	Cal Poly		wsiembiel@calpoly.edu
SCOTT DUFFIELD	HERITAGE RANCH CSD	HERITAGE RANCH	SCOTT@HERITAGERANCHCSD.CA.GOV.
Kenny Nichols	KSBY TV 6	SLO / SB Co.	
Nick Johnston	Cal Poly	SLO	nicholas2johnston@gmail.com

From: Jillian H. Ferguson <jferguson@co.slo.ca.us>
Sent: Thursday, March 28, 2019 1:21 PM
To: Brislawn, Jeff P
Cc: Carr, Amy
Subject: RE: [EXT]RE: Please review the draft Hazard Profile & Risk Assessment
Attachments: Public Workshop 1 sign-in sheets.pdf; HMPC 2 Sign-in sheets.pdf

Hi Jeff –

Please find the sign-in sheets attached. The local news did not feature a video segment about the meeting, but there was a brief report featured in the mornings news feed. There is always next time!

Jillian

From: Brislawn, Jeff P <jeff.brislawn@woodplc.com>
Sent: Thursday, March 21, 2019 1:07 PM
To: Jillian H. Ferguson <jferguson@co.slo.ca.us>
Subject: [EXT]RE: Please review the draft Hazard Profile & Risk Assessment

ATTENTION: This email originated from outside the County's network. Use caution when opening attachments or links.

Jillian,
Thanks for the followup message. Can you send out the Presentation and handouts attached? I'll put a more specific meeting summary that can be sent out later. Can you also send me a scan of the meeting sign in for both the HMPC and public meetings? Did you make the local news?
Thanks
Jeff

From: Jillian H. Ferguson <jferguson@co.slo.ca.us>
Sent: Thursday, March 21, 2019 12:15 PM
To: Joe Guzzardi <jguzzardi@co.slo.ca.us>; Scott Milner <smilner@co.slo.ca.us>; Dave Flynn <dflynn@co.slo.ca.us>; Kate Ballantyne <kballantyne@co.slo.ca.us>; Mladen Bandov <mbandov@co.slo.ca.us>; Lynda Auchinachie <lauchinachie@co.slo.ca.us>; dt5314@gmail.com; slieberman_fivecitiesfire.org <slieberman@fivecitiesfire.org>; Camilla Karamanlis <ckaramanlis@arroyogrande.org>; mdowning_arroyogrande.org <mdowning@arroyogrande.org>; Tom Peterson <tompeter@atascadero.org>; 'Casey Bryson' <cbryson@atascadero.org>; jpeters_gbpd.org <jpeters@gbpd.org>; sknuckles_morrobayca.gov <sknuckles@morrobayca.gov>; Matthew Vierra <mvierra@morrobayca.gov>; jstornetta_prcity.com <jstornetta@prcity.com>; mgruver@pismobeach.org; Aggson, Keith <kaggson@slocity.org>; Maggio, Rodger <rmaggio@slocity.org>; BHill_slocity.org <BHill@slocity.org>; Read, Chris <cread@slocity.org>; Blattler, James <jblattler@slocity.org>; 'mychal@sslocsd.us'; rkoon_cayucosd.org <rkoon@cayucosd.org>; chrism_portsanluis.com <chrism@portsanluis.com>; hagemann.associates_gmail.com <hagemann.associates@gmail.com>; gm@groundsquirrelhollowcsd.org; scott@heritageranchcsd.com; rosborne@lososocsd.org; MIglesias_ncsd.ca.gov <MIglesias@ncsd.ca.gov>; Fireprevention@sanmiguelcsd.org; kelly.dodds@sanmiguelcsd.org; cmurguia@graceenviro.com; Nicole Miller <nicole@oceanocsd.org>; 'Carey Casciola' <carey@oceanocsd.org>; jbriltz_templetoncsd.org <jbriltz@templetoncsd.org>; Chief_templetoncsd.org <Chief@templetoncsd.org>
Cc: Karen Nall <knall@co.slo.ca.us>; Robert Fitzroy <rfitzroy@co.slo.ca.us>; Brislawn, Jeff P <jeff.brislawn@woodplc.com>; Kip J. Morais <kmorais@co.slo.ca.us>
Subject: RE: Please review the draft Hazard Profile & Risk Assessment

Good morning –

Thanks again to those that attended Tuesday morning's HMPC meeting. This is a friendly reminder that any plans, studies, statistics regarding tourism, hazards, land use etc. are appreciated. Please forward materials to Jeff - jeff.brislawn@woodplc.com. Thank you for your continued efforts.

I will be in touch regarding April HMPC meetings. Please feel free to contact me with any questions.

Best,

Jillian Ferguson | Planner, Long Range Division
(p) 805-781-1391 jferguson@co.slo.ca.us



From: Jillian H. Ferguson

Sent: Friday, March 15, 2019 4:16 PM

To: Joe Guzzardi <jguzzardi@co.slo.ca.us>; Scott Milner <smilner@co.slo.ca.us>; Dave Flynn <dflynn@co.slo.ca.us>; Kate Ballantyne <kballantyne@co.slo.ca.us>; Mladen Bandov <mbandov@co.slo.ca.us>; Lynda Auchinachie <lauchinachie@co.slo.ca.us>; dt5314@gmail.com; slieberman_fivecitiesfire.org <slieberman@fivecitiesfire.org>; Camilla Karamanlis <ckaramanlis@arroyogrande.org>; mdowning_arroyogrande.org <mdowning@arroyogrande.org>; Tom Peterson <tompeter@atascadero.org>; 'Casey Bryson' <cbryson@atascadero.org>; jpeters_gbpd.org <jpeters@gbpd.org>; sknuckles_morrobayca.gov <sknuckles@morrobayca.gov>; 'Matthew Vierra' <mvierra@morrobayca.gov>; jstornetta_prcity.com <jstornetta@prcity.com>; mgruver@pismobeach.org; Aggson, Keith <kaggson@slocity.org>; Maggio, Rodger <rmaggio@slocity.org>; BHill_slocity.org <BHill@slocity.org>; Read, Chris <cread@slocity.org>; Blattler, James <jblattler@slocity.org>; 'mychal@sslocsd.us'; rkoon_cayucosd.org <rkoon@cayucosd.org>; 'chrism@portsanluis.com' <chrism@portsanluis.com>; hagemann.associates_gmail.com <hagemann.associates@gmail.com>; gm@groundsquirrelhollowcsd.org; 'scott@heritageranchcsd.com' <scott@heritageranchcsd.com>; rosborne@losososcscsd.org; 'Mario Iglesias' <MIglesias@ncsd.ca.gov>; Fireprevention@sanmiguelcsd.org; kelly.dodds@sanmiguelcsd.org; cmurguia@graceenviro.com; 'Nicole Miller' <nicole@oceanocsd.org>; 'Carey Casciola' <carey@oceanocsd.org>; 'Jeff Briltz' <jbriltz@templetoncsd.org>; 'Chief' <Chief@templetoncsd.org>
Cc: Karen Nall <knall@co.slo.ca.us>; Robert Fitzroy <rfitzroy@co.slo.ca.us>; 'Brislawn, Jeff P' <jeff.brislawn@woodplc.com>; Kip J. Morais <kmorais@co.slo.ca.us>
Subject: Please review the draft Hazard Profile & Risk Assessment

Hello HMPC:

The draft Hazard Profile and Risk Assessment sections of the San Luis Obispo County Hazard Mitigation Plan have been developed by Wood and are now available for review on a Google Drive as Google Docs. Word docs are also included, but our preference is that reviewers use the Google Doc to make any edits or comments so that others can view them.

<https://drive.google.com/drive/folders/1E3oKhVTn69J5Jlk4DLM3zqpoQXnPC7Qp?usp=sharing>

The hazard sections are in separate documents organized as such (*are new hazards):

- Introduction and Hazard ID overview
- Assets Summary
- Adverse Weather
- Agricultural Pest Infestation and Plant Disease/Marine Invasive Species
- Biological Agents (naturally occurring)
- Coastal Storm/Coastal Erosion/Sea Level Rise*
- Dam Incidents*
- Drought and Water Shortage*
- Earthquake
- Flood
- Landslide and Debris Flow
- Subsidence*
- Tsunami
- Wildfire
- Spreadsheets with additional details on a parcel loss analysis by hazard, by jurisdiction, and historic buildings analysis. This information will eventually go in an appendix and inform the jurisdictional annexes.

Please note some items in the documents are highlighted in Green to denote work in progress, such as a critical facility GIS analysis. Yellow highlight indicates text that need verified or updated with HMPC input or is an outstanding item. A Hazardous Materials section will be added by April 15th.

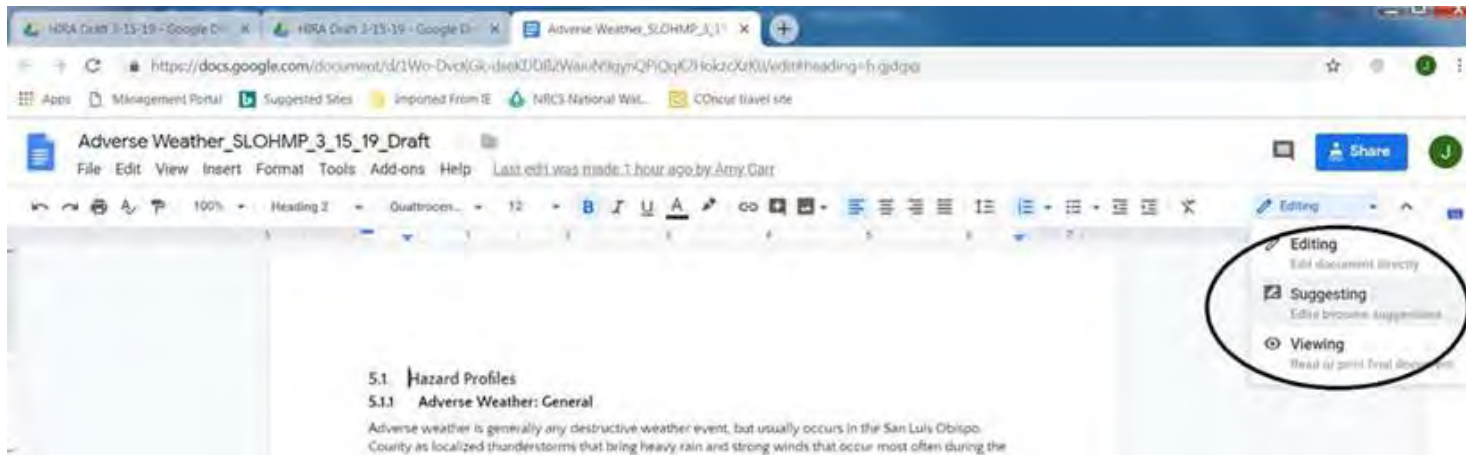
Please also note that sometimes the formatting gets affected by the Google Doc conversion. For example the landscape pages with maps appear to be cut off but won't be in the Word version. Please ignore formatting issues during the review.

The HMPC meeting on March 19th will cover the highlights of the update of the Hazard Identification and Risk Assessment. We are asking the HMPC to review the HIRA draft by April 5th. The updated HIRA will provide the basis for updates to the mitigation

strategy. Thus it is being requested that the HMPC familiarize themselves with the updated HIRA and new vulnerability analysis, and let Wood know if they have captured the key issues accurately. Please note that the focus of this HIRA is at the County scale, and while there is some jurisdictional specific detail there will be more captured within the jurisdictional annexes.

Comments can be made in the Google Doc. **IMPORTANT:** If editing or commenting please choose Suggesting as shown in the screen capture below. This will allow everyone to view suggested edits. Alternately, you can download Word versions on the Google Drive and utilize Track Changes and send them, or an email with comments, to Jeff Brislawn at Wood. Jeff.brislawn@woodplc.com.

Thank you everyone for your assistance!



Jillian Ferguson | Planner, Long Range Division

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From: Jillian H. Ferguson <jferguson@co.slo.ca.us>
Sent: Thursday, March 28, 2019 1:10 PM
To: Joe Guzzardi; Scott Milner; Dave Flynn; Kate Ballantyne; Bryan Iwamoto; Francisco Pares; Mladen Bando; Lynda Auchinachie; dt5314@gmail.com; slieberman_fivecitiesfire.org; Camilla Karamanlis; mdowning_arroyogrande.org; Tom Peterson; 'Casey Bryson'; jpeters_gbpd.org; sknuckles_morrobyca.gov; Matthew Vierra; jstornetta_prcity.com; mgruver@pismobeach.org; Aggson, Keith; Maggio, Rodger; BHill_slocity.org; Read, Chris; Blattler, James; ';; rkoon_cayucosd.org; Brian O'Neill; chrism_portsanluis.com; hagemann.associates_gmail.com; gm@groundsquirrelhollowcsd.org; scott@heritageranchcsd.com; rosborne@losososcscd.org; Mlglesias_ncsd.ca.gov; Fireprevention@sanmiguelcsd.org; kelly.dodds@sanmiguelcsd.org; cmurguia@graceenviro.com; Nicole Miller; 'Carey Casciola'; jbriltz_templetoncsd.org; Chief_templetoncsd.org
Cc: Karen Nall; Kip J. Morais; Jeffery Legato; Brislawn, Jeff P; Gira, Daniel; Robert Fitzroy
Subject: HMPC Updates and Reminders
Attachments: SanLuisObispo_HMP_Risk_Goals_Meeting_Presentation.pdf; GoalsHandoutSLO.docx; HIRA Summary Handout.docx; SLO County HMP Risk and Goals Meeting Mar 19 Summary.docx

Good afternoon –

Thanks again to those that attended Tuesday morning's HMPC meeting. Attached is a meeting summary, the handouts from the meeting, and the presentation. Those that were not able to attend please review the presentation to stay in the loop. In preparation for the next phase of the planning process here is a schedule of events and due dates on specific items:

- Public survey: Please advertise this link through your typical outreach methods including posting on jurisdictional websites, email blasts, or social media. Please send an email to Jeff - jeff.brislawn@woodplc.com with a note or documentation of how/where the information was shared.
Due date: April 12 (we have 81 responses so far).
<https://www.surveymonkey.com/r/SLOHMPupdate>
- Jurisdictional Workbooks:
Due date: March 15
Note: There are 9 jurisdictions outstanding. Please provide to Jeff Brislawn as soon as possible.
- Review of HIRA on Google Drive-
Due date: April 5
Link:
<https://drive.google.com/drive/folders/1E3oKhVTn69J5jIk4DLM3zqpoQXnPC7Qp?usp=sharing>
- Goals Update Revisions -
Due date: April 17
Note: Discuss the handout amongst your local planning teams to determine if you want to modify or change existing jurisdictional-specific goals, or potentially adopt the county-level goals (also being reviewed). Provide mark up of handout to Jeff or bring to late April meeting for discussion.
- Mitigation Action Status –

Due date: TBD prior to late April meetings.

Note: Jurisdictions with existing LHMPs will need to provide a status on the mitigation actions or projects identified. A worksheet will be created to facilitate this. Looking for input on if the action has been completed, is ongoing, is deferred but still relevant, or should be deleted from the plan.

Overall Schedule –

Next HMPC meetings and second public workshop – April 23-25, specifics TBD

First Draft of updated HMP and Jurisdictional Annexes for HMPC Review: June 14

Comments from HMPC due: July 8th

Public Review Draft: July 12th

Public comments due: August 9th

Final Plan for Cal OES Review: August 16th

Cal OES review comments – Mid Sept (estimated)

FEMA review – October-November (estimated)

Final Approved HMP for local adoption – December (estimated)

Thank you,

Jillian Ferguson | Planner, Long Range Division

(p) 805-781-1391 jferguson@co.slo.ca.us

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COUNTY OF SAN LUIS OBISPO
Planning & Building

**SAN LUIS OBISPO COUNTY MULTI-JURISDICTIONAL HAZARD
MITIGATION PLAN**

2019 UPDATE

MEETING #3 Goals, Capabilities and Action Status

Thursday, April 25, 2019

9:00 – 10:30 am

**Library Community Room
995 Palm St., San Luis Obispo, CA**

- 1. Introductions**
- 2. Planning Process Status Update**
- 3. Updating Goals for the Mitigation Plan**
- 4. Additional Vulnerability Assessment Data**
- 5. Hazards Significance Prioritization for Mitigation**
- 6. Capability Assessment Update Discussion**
- 7. Mitigation Action Progress Summary and Discussion**
- 8. Recommended New Mitigation Actions**
- 9. Questions and Answers/Adjourn**

Safety Element (1999)

Emergency Preparedness

Goal S-1: Attain a high level of emergency preparedness

Water Hazards

Goal S-2: Reduce damage to structures and the danger to life caused by flooding, dam inundation and tsunami

Fire Safety

Goal S-4: Reduce the threat to life, structure and the environment caused by fire.

Geologic and Seismic Hazards

Goal S-5: Minimize the potential for loss of life and property resulting from geologic and seismic hazards.

Other Safety Issues

Goal S-6: Reduce the potential for harm to individuals and damage to the environment from aircraft hazards, radiation hazards, hazardous materials, electromagnetic fields, radon, and hazardous trees

Conservation and Open Space Element (2010)

Air Quality

Goal AQ 1: Per capita vehicle-miles-traveled countywide will be substantially reduced consistent with statewide targets.

Goal AQ 2: The County will be a leader in implementing air quality programs and innovations.

Goal AQ 3: State and federal ambient air quality standards will, at a minimum, be attained and maintained.

Goal AQ 4: Greenhouse gas emissions from County operations and communitywide sources will be reduced from baseline levels by a minimum of 15% by 2020.

Goal AQ 5: The County will adapt to adverse climate change.

Bio Resources

Goal BR 1: Native habitat and biodiversity will be protected, restored, and enhanced.

Goal BR 2: Threatened, rare, endangered, and sensitive species will be protected.

Goal BR 3: Maintain the acreage of native woodlands, forests, and trees at 2008 levels.

Goal BR 4: The natural structure and function of streams and riparian habitat will be protected and restored.

Goal BR 5: Wetlands will be preserved, enhanced, and restored.

Goal BR 6: The County's fisheries and aquatic habitats will be preserved and improved.

Goal BR 7: Significant marine resources will be protected.

Cultural Resources

Goal CR 2: The County will promote public awareness and support for the preservation of cultural resources in order to maintain the county's uniqueness and promote economic vitality.

Goal CR 3: The county's historical resources will be preserved and protected.

Goal CR 4: The county's known and potential Native American, archaeological, and paleontological resources will be preserved and protected.

Energy

Goal E 4: Green building practices will be integrated into all development.

Goal E 7: Design, siting, and operation of non-renewable energy facilities will be environmentally appropriate.

Mineral Resources

Goal MN 1: Conservation and development of significant mineral deposits will be a high priority but will be balanced with other County general plan goals and policies.

Goal MN 2: Significant mineral resources will be protected from land uses that threaten their availability for future mining.

Goal MN 3: Balance mining of mineral resources with sensitive natural resources and existing adjacent uses.

Open Space Resources

Goal OS 1: Important open space areas will be identified, protected, sustained, and where necessary, restored and reclaimed

Goal OS 2: Open space resources will be protected and sustained on public lands.

Goal OS 3: Ongoing public education programs about conservation, protection, and stewardship of open space resources will be encouraged.

Soil Resources Goals and Policies

Goal SL 1: Soils will be protected from wind and water erosion, particularly that caused by poor soil management practices

Goal SL 2: Watersheds and ecological function will be maintained through soil conservation.

Goal SL 3: Important Agricultural Soils will be conserved.

Water Resources

Goal WR 1: The County will have a reliable and secure regional water supply (IRWM).

Goal WR 2: The County will collaboratively manage groundwater resources to ensure sustainable supplies for all beneficial uses.

Goal WR 3: Excellent water quality will be maintained for health of people and natural communities.

Goal WR 4: Per capita potable water use in the county will decline by 20 percent by 2020.

Goal WR 5: The best possible tools and methods available will be used to manage water resources.

Goal WR 6: Damage to life, structures, and natural resources from floods will be avoided.

Agricultural Element (2010)

Goal AG1: Support County Agricultural Production

Goal AG2: Conserve Agricultural Resources

Goal AG3: Protect Agricultural Lands

Goal AG4: Encourage Public Education and Participation

Economic Element (2012)

Goal EE 1: Promote a strong and viable local economy by pursuing policies that balance economic, environmental, and social needs of the county.

Goal EE 2: Retain and enhance a diverse economy.

Goal EE 3: Provide for strategically-located opportunities for economic development.

Goal EE 5: Provide support for economic development in San Luis Obispo County.

Housing Element (2014)

Overall Goal: Achieve an adequate supply of safe and decent housing that is affordable to all residents of San Luis Obispo.

Parks and Recreation Element (2006)

Goal #4: Natural areas preserved within the County that protect unique and sensitive resources.

Noise Element (1992)

1. To protect the residents of San Luis Obispo County from the harmful and annoying effects of exposure to excessive noise.
2. To protect the economic base of San Luis Obispo County by preventing incompatible land uses from encroaching upon existing or planning noise-producing uses.
3. To preserve the tranquility of residential areas by preventing the encroachment of noise-producing uses.
4. To educate the residents of San Luis Obispo County concerning the effects of exposure to excessive noise and the methods available for minimizing such exposure.
5. To avoid or reduce noise impacts through site planning and project design, giving second preference to the use of noise barriers and/or structural modifications to buildings containing noise-sensitive land uses.

Land Use Element (including the coastal zone and inland frameworks for planning)

Goal 1: Preserve open space, scenic natural beauty and natural resources. Conserve energy resources. Protect agricultural land and resources.

1. Environment – Maintain and protect all living environment that is safe, healthful and pleasant for all residents by:
 - a. Assuring the protection of coastal resources such as wetlands, coastal streams, forests, marine habitats, and threatened and endangered species.
 - c. Preserving and sustaining important water resources, watersheds, and riparian habitats.
 - d. Giving highest priority to avoiding significant environmental impacts from development through site and project design and alternatives. Where such impacts cannot be avoided, minimize and mitigate them to the maximum extent feasible.
6. Population Growth – Provide for an environmentally sustainable rate of orderly development within the planned capacities of resources and services by:
 - a. Recognizing the impacts of land use and water consumption in a semi-arid climate
 - b. Developing and maintaining information on population growth rates.
 - e. Guiding allocated development to areas of the county capable of sustaining growth without adverse effects

Goal 2: Strengthen and direct development toward existing and strategically planned communities.

2. Location and Timing of Urban Development – Plan for a land use pattern and population distribution that is consistent with the capabilities of existing public services and facilities by:
 - b. Encouraging the voluntary transfer of potential development from antiquated subdivisions, agricultural lands, environmentally sensitive areas, and hazard lands into communities, using the latest ordinances, positive incentives, settlement strategies, and transfer of development credits programs, where feasible.

Goal 3: Foster distinctive, attractive communities with a strong sense of place.

Goal 10: Encourage community and stakeholder collaboration.

Goal 11: Strengthen regional cooperation.

SIGN-IN SHEET

SAN LUIS OBISPO COUNTY MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN UPDATE PROJECT

HMPC #3 – Goals, Capabilities, and Action Status

Thursday, April 25, 2019 9:00 AM – 10:30 AM

Library Community Room 995 Palm St. San Luis Obispo, CA

Name	Jurisdiction/Agency/Dept	Title	Phone	E-mail
Milner, Scott	SLO Co. OES	Emergency Servs. Coord.	805-781-4128	smilner@co.slo.ca.us
Camilla Karamanlis	City of AG	Program Analyst	805 473 5448	ckaramanlis@arroyogrande.org
Lieberman, Gene	Five Cities Fire	Fire Chief	473-5490	slieberman@fivecities.org
Math Downing	City of AG	Planning Manager	473-5424	mldowning@arroyogrande.org
Renee Osborne	San Simeon CSD Los Osos CSD	GM	528-9379	rosborne@losososcsd.org
Alan Peters	CAL FIRE	DIV CHIEF	805-903-3406	Alan.Peters@fire.ca.gov
JAMEL BLATTEN	CITY OF SLO	ADMIN ANALYST	805-781-7392	jblatten@city.slo.ca.gov
Chris Muzen	Port San Luis HD	Facilities Manager	805-595-8419	Chris.m@portsanluis.ca.gov
Dan Gilmore	Ground Squirrel Hollow	GM	805 441 4428	gm@groundsquinelhollowcsd.org
Bryan Iwamoto	County of SLO	Civic Park Fellow	949 939 7561	biwamoto@co.slo.ca.us
Mario Iglesias	Nipomo CSD	GM	805 929-1133	miglesias@nipomocsd.ca.gov
Tom Peterson	ATASCADERO FIRE	Fire Marshal	(805) 470-3326	tom.peterson@atascadero.org

SAN LUIS OBISPO COUNTY MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN UPDATE PROJECT

Thursday, April 25, 2019 9:00 AM – 10:30 AM

[illegible]

From: Jillian H. Ferguson <jferguson@co.slo.ca.us>
Sent: Thursday, April 25, 2019 4:28 PM
To: Jeffery Legato; Brislawn, Jeff P; Kip J. Morais; Joe Guzzardi; Scott Milner; Dave Flynn; Kate Ballantyne; Bryan Iwamoto; Francisco Pares; Mladen Bandov; Lynda Auchinachie; dt5314@gmail.com; slieberman_fivecitiesfire.org; Camilla Karamanlis; mdowning_arroyogrande.org; Tom Peterson; 'Casey Bryson'; jpeters@gdpd.org; sknuckles_morrobayca.gov; 'Matthew Vierra'; jstornetta_prcity.com; mgruver@pismobeach.org; Aggson, Keith; Maggio, Rodger; BHill_slocity.org; Read, Chris; Blattler, James; ','; rkoon_cayucosd.org; chrism_portsanluis.com; hagemann.associates_gmail.com; gm@groundsquirrelhollowcsd.org; scott@heritageranchcsd.com; rosborne@losososcscsd.org; Mlglesias_ncsd.ca.gov; jstornetta_prcity.com; Fireprevention@sanmiguelcsd.org; kelly.dodds@sanmiguelcsd.org; cmurguia@graceenviro.com; nicole@oceanocsd.org; 'Carey Casciola'; jbrilz@templetoncsd.org; Chief_templetoncsd.org; Gira, Daniel; Robert Fitzroy; jpeters_gbpdc.org; tamara.parent@sanmiguelcsd.org; dcrawford@cayucosd.org; Alan.Peters_fire.ca.gov; wsiembie_calpoly.edu
Cc: Brislawn, Jeff P; Kip J. Morais; Scott Milner; Karen Nall
Subject: HMPC Follow-up
Attachments: 3_DRAFT Hazard Priority Summary Handout_all jurisdictions .docx; 3_REVISIED County Goals handout.docx; SLO HMP Update Meeting 3 Agenda.docx

Good afternoon, HMPC –

For those that missed this morning's meeting, please take some time to:

1. Review the goals handout (attached), revise and provide edits (San Luis Obispo is off the hook).
FIRM DUE DATE: MAY 3rd
 - a. Are they still comprehensive?
 - b. Do they need to be modified, consolidated or adjusted to meet current priorities?
 - c. New jurisdictions – Can use the overall county goals, or develop their own.
2. Review the draft Hazard Priority Summary handout (attached). **FIRM DUE DATE: MAY 3rd**
 - a. Please consider if the probability, magnitude/severity and significance reflect your individual communities accurately.
 - b. This is important for each jurisdiction's planning committee to review and confirm.
 - c. Each jurisdiction will need mitigation actions for medium and high significance hazards identified in the HMP.
 - d. Please send changes to Jeff Brislawn - jeff.brislawn@woodplc.com

Please contact me with any questions. I am here to assist wherever I can. Thank you!

Best,

Jillian Ferguson | Planner, Long Range Division

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COUNTY OF SAN LUIS OBISPO
Planning & Building



SLO Multi-jurisdictional Hazard Mitigation Plan Goals Update Worksheet – 4-24-19

San Luis Obispo County Local Hazard Mitigation Plan – 2019 Goals and Objectives

(Red text is new or changed) [Bold red is suggested changes from HMPC Meeting #3]

Goal 1 – Promote understanding and support for hazard mitigation by key stakeholders and the public within the County of San Luis Obispo.

- Objective 1.1 – Educate key stakeholders and the public to increase awareness of hazards and opportunities for mitigating hazards

Goal 2 – Mitigate hazard impacts to existing and future development.

Ensure that future development is protected from natural disasters.

- Objective 2.1 – Limit new development in hazard areas, and as permissible, build to standards that will prevent or reduce damage.

Goal 3 – Build and support local capacity, **to address**, and commitment to minimize, the County of San Luis Obispo's vulnerability to potential hazards through collaboration with the incorporated cities and **special districts**.

- Objective 3.1 - Improve existing capabilities to manage emergency situations
- Objective 3.2 - Enhance the safety of ~~residents, students and staff within~~ the community
- Objective 3.3 - Assure that at-risk populations and those with access and functional needs (AFN) are addressed in all plans and procedures
- **Objective 3.4 – Identify and collaborate on hazard mitigation projects that benefit multiple jurisdictions.**

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Goal 4 - Minimize the level of **injury and loss of life and** damage ~~and losses to people to~~, existing and future critical facilities, **property** and infrastructure due to ~~flooding~~ **natural hazards**.

- Objective 4.1 - Enhance the ability of community assets, particularly critical facilities, located in ~~the 100-year floodplain~~ **flood zones** to handle ~~existing~~ **average** and projected flood waters.
- **Objective 4.2** – Develop a comprehensive approach to reducing the level of damage and losses due to wildland fires through resilient community and critical infrastructure design, vegetation management, weed abatement, ignition resistant construction, code enforcement, GIS mapping, and planning processes.
- **Objective 4.3** – In order to better protect life and property, develop more accurate, comprehensive series of countywide GIS geology maps and data sets
- **Objective 4.4** - Develop a comprehensive approach to reducing the level of damage and losses due to natural hazards through improved policies, procedures, training, and evacuation planning

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Goal 5 - Minimize human morbidity and mortality as a result of biological agent threats.

- Objective 5.1 - Curtail the entry and spread of infectious diseases within San Luis Obispo County



Goal 6 - Minimize the extent of damage and destruction to **forests**, crops, farm animals, humans, and existing and future facilities as a result of agricultural pests and disease.

- Objective 6.1 - Curtail the entry of harmful agricultural pests into San Luis Obispo County
- Objective 6.2 - Quickly detect and eradicate pathogenic pests within the County. When eradication is not feasible, minimize spread

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Goal 7 - Adopt **and** implement strategies to enable the County to prepare for and adapt to the impacts of climate change through collaboration with the incorporated cities **and special districts**.

- Objective 7.1 - Minimize the harmful effects of climate change by identifying, assessing and preparing for impacts. Coordinate with the incorporated cities and special districts to implement strategies with regional significance.

Deleted Goals

Goal 5 - Minimize the level of damage and losses to people, existing and future critical facilities and infrastructure due to wildland fires.

Goal 6 - Minimize the level of damage and losses to people, existing and future critical facilities and infrastructure due to geological events (earthquakes, landslides, and liquefaction)

Goal 7 - Minimize the level of damage and losses to people, existing and future critical facilities and infrastructure due to tsunami events

City of San Luis Obispo 2019 Goals

Goal 1 - Cultivate a disaster-resistant **and resilient** community through implementation of risk reduction measures and increased public awareness to prepare for, respond to, and recover from natural and human-caused hazard events.

Goal 2 - Reduce the severity of damage and losses due to natural and human-caused hazards.

City of Atascadero Local Hazard Mitigation Plan - 2014

Goal 1 – Increase public awareness of current drought conditions

Goal 2 – Minimize the loss of property and life as the result of a windstorm

Goal 3 – Reduce the possibility of damage and losses due to dam failure

Goal 4 – Reduce the possibility of damage and losses due to earthquake

Goal 5 – Minimize property damage as a result of expansive unstable soil conditions

Goal 6 – Reduce the possibility of damage and losses due to floods

Goal 7 – Reduce the possibility of damage and losses due to land subsidence

Goal 8 – Reduce the possibility of damage and losses due to wildland fires

City of Paso Robles Local Hazard Mitigation Plan – 2016

Goal 1 – Minimize loss of life, injury and damage to property, the economy, and the environment from the hazards identified in the 2016 LHMP



Goal 2 – Build and enhance local mitigation capabilities to reduce the hazards identified in the 2016 LHMP. This will help ensure individual safety, reduce damage to public buildings and guarantee continuity of emergency services

City of Morro Bay Local Hazard Mitigation Plan - 2006

- Goal 1 – Promote disaster-resistant future development
- Goal 2 – Promote understanding and support for hazard mitigation by key stakeholders and the public within the City of Morro Bay
- Goal 3 – Build and support local capacity and commitment to minimize the City of Morro Bay's vulnerability to potential hazards
- Goal 4 – Minimize the level of damage and losses to people, existing and future critical facilities and infrastructure due to flooding
- Goal 5 – Minimize the level of damage and losses to people, existing and future critical facilities and infrastructure due to tsunamis
- Goal 6 – Minimize the level of damage and losses to people, existing and future critical facilities and infrastructure due to wildland fires
- Goal 7 – Minimize the level of damage and losses to people, existing and future critical facilities and infrastructure due to earthquakes
- Goal 8 – Minimize the level of damage and losses to people, existing and future critical facilities and infrastructure due to accidental spills and releases of hazardous materials
- Goal 9 – Minimize the level of damage and losses to people, existing and future critical facilities and infrastructure due to biological agent threats

City of Pismo Beach Local Hazard Mitigation Plan – 2014

- Goal 1 – Promote disaster-resistant development
- Goal 2 – Build and support local capacity to enable the public to prepare for, respond to and recover from disasters
- Goal 3 – Reduce the possibility of damage and losses due to bluff/erosion failure
- Goal 4 – Reduce the possibility of damage and losses due to coastal storm
- Goal 5 – Reduce the possibility of damage and losses due to dam failure
- Goal 6 – Reduce the possibility of damage and losses due to earthquake
- Goal 7 – Reduce the possibility of damage and losses due to flood
- Goal 8 – Reduce the possibility of damage and losses due to hazardous material events
- Goal 9 – Reduce the possibility of damage and losses due to landslide
- Goal 10 – Reduce the possibility of damage and losses due to tsunami
- Goal 11 – Reduce the possibility of damage and losses due to wildland fire

Arroyo Grande Multi-Jurisdictional Local Hazard Mitigation Plan – 2014

City of Arroyo Grande

- Goal 1 - Minimize the level of damage and losses due to flooding
- Goal 2 - Minimize the level of damage and losses due to earthquakes



Goal 3 - Minimize the level of damage and losses due to wildland and structure fires

Goal 4 - Minimize impacts to the community from dam inundation events

South San Luis Obispo County Sanitation District

Goal 1 – Minimize earthquake damage and losses due to earthquakes

Goal 2 – Minimize flooding damage and losses due to flooding

Goal 3 – Minimize the level of losses and damage due to fires

Goal 4 – Minimize tsunami impacts to South San Luis Obispo County Sanitation District facilities

Lucia Mar Unified School District

Goal 1 – Minimize earthquake damage and losses to School District facilities due to earthquake

Goal 2 – Minimize damage due to flooding

Goal 3 – Minimize damage due to fires

Goal 4 – Minimize potential tsunami impacts to Lucia Mar Unified School District facilities

California State Hazard Mitigation Plan – 2018

Goal 1 – Significantly reduce life and loss

Goal 2 – Minimize damage to structures and property, and minimize interruption of essential services and activities

Goal 3 – Protect the environment

Goal 4 – Promote community resilience through integration of hazard mitigation with public policy and standard business practices

SAN LUIS OBISPO COUNTY MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

2019 UPDATE

MEETING #3 Goals, Capabilities and Action Status

Meeting Minutes

Thursday, April 25, 2019

9:00 – 10:30 am

Library Community Room

995 Palm St., San Luis Obispo, CA

1. Introductions

- All jurisdictions represented, except for San Miguel CSD and Cayucos Sanitary District.

2. Planning Process Status Update

- No questions were raised regarding project status.

3. Updating Goals for the Mitigation Plan

Goals: Questions/comments:

- Comment on Goal #3: Clarify the meaning of “local capacity” by changing the text to read: “Build and support local capacity *to address* and commitment to minimize.....”
- Comment on Goal #4: Rearrange and condense the text to read: “Minimize level of injury and loss of life and damage to existing and future critical facilities.....”
 - There was a suggestion made to leave out the word “natural” to encompass all hazards, natural and manmade.
 - There was a suggestion made to combine the Goal #4 Objectives to reduce redundancy.
 - Jeff noted that some of these may be revisited when we go through mitigation actions to see what needs to be general or specific.
- Comment on Goals #5 and #6: These encompass Public Health issues, and may be necessary to acknowledge the public health and agricultural departments.
 - There was a comment to change Goals #5 and #6 to objectives or to generalize them.
- It was clarified that each hazard is defined and discussed in the hazard profile, and the goals themselves do not need to define each hazard.
- Goal #6: Add “forest” into the goal to encompass forest pests and disease.

- Jeff commented that this goal could also include natural resources, to be more all-encompassing.
- Goal #7: Question regarding sea level rise and its place in the objectives for Goal #7 – should this be clarified, reduced, expanded upon?
 - This comment will be revisited during discussion of mitigation measures.

4. Additional Vulnerability Assessment Data

- Since the last committee meeting, hazard profiles have been commented on by each jurisdiction.
- Wood has compiled and analyzed a GIS database of critical facilities as well as qualitative assessments of other resources.

Hazardous Materials Overview:

- There was a comment regarding the oil and gas platforms: Oil platforms are south of Point Conception and the littoral currents pull water south. The potential for oil spill affecting SLO County may be low. Revisit and confirm with NOAA if this may be applicable for the southwestern jurisdictions (i.e. Arroyo Grande).
- Comment regarding hazardous materials incidents: the majority of responses are for clandestine drug labs and chemical dumps, in which chemicals are dumped on the side of road. This poses a threat to local areas.
- Statistics from reported spills were not readily available at this meeting, but may be acquired through the County.

5. Hazards Significance Prioritization for Mitigation

- There are detailed spreadsheets on the Google Drive of critical facilities, each jurisdiction, and an overlay with GIS.
- Criteria have been established for ranking magnitude and severity of each hazard.
- Feedback from jurisdictions was encouraged on the Hazard Identification and Risk Assessment Worksheet.
- Highlighted sections in the Hazard Identification & Risk Assessment Summary indicate further discussion and feedback needed.
- San Simeon and Cayucos are the only jurisdictions not represented at this meeting.
- Comment regarding significance thresholds: Significance thresholds are unclear: What are the thresholds for low, medium, high?
 - Are significance thresholds just based on magnitude/severity?
 - Answer: Communities that may be impacted by hazards are ranked low because of low probability, but medium and high indicate higher probability and the need for mitigation measures.

- Example provided: Tsunami in coastal communities ranked medium but the probability is low – why ranked medium?
 - Answer: This hazard is ranked medium to encourage mitigation measures in applicable jurisdictions (i.e. mapping, evacuation routes, and tsunami inundation zones).

6. Capability Assessment Update Discussion (20 Min)

- 2014 county-wide HMP looked at hazards, policy plan procedures, and capability for hazard mitigation.
- Because we have added new hazards, we need to call out new capabilities and existing capabilities that apply/address these existing hazards.
- The County has robust planning and mitigation capabilities, and we want to highlight these capabilities.
- When the draft of the Hazard Mitigation Plan is released, each jurisdiction will review.
- Some jurisdictions could have similar capabilities called out.
- When FEMA and the state review these plans, they will look for ways to review and expand capabilities to ensure efficacy and applicable improvements.
 - For example, this may include enhancing the floodplain program, storm and tsunami readiness in the County.
- Transfer of development credits program: existing in the County, is it being accurately used?
- The County is in process of becoming tsunami ready. This is a work in progress, and requires overcoming problems with installing signage within Caltrans encroachments.
- 3 communities are currently Firewise.

7. Mitigation Action Progress Summary and Discussion (15 Min)

- Mitigation actions will be discussed more thoroughly at the 4/30 meeting.
- Jurisdictions are encouraged to send feedback to Jillian and Jeff for discussion in the next meeting.
- The Mitigation Action Progress Summary Table includes jurisdictions that have given feedback.
 - Some CSDs are brand new in the plan and do not have an established LHMP.
- The goal of the Multi-jurisdictional HMP is to establish a realistic and attainable action plan for each community.
 - Through this process, some actions may be deemed more response oriented, and may be removed to focus on applicable mitigation.

- Question: Some County mitigation measures are recurring and general without much substance. What are the recommendations to keep or remove?
 - Answer: Jeff recommends that these become ongoing capabilities.
 - For example, public education and tsunami awareness is noted as an ongoing capability as opposed to a specific action.
- Question to Jack: how long do jurisdictions have to finalize updates to the HMP?
 - Answer: in the month of May, we will be diving into mitigation actions, and each jurisdiction will have time to develop them. May 20th is the current target to finalize input on the mitigation actions.
- Input on existing mitigation actions gathered hopefully sooner than that.
- The Draft for jurisdictions to review is on schedule to be wrapped up by June.
- Input on the feedback mitigation action tracker is still required, which was sent by email. Jeff will follow up to discuss with individual jurisdictions (including progress table on mitigation actions from LHMPs).
 - There will be template for new mitigation actions and feedback will be welcomed.
- Hazard risk summary worksheet (to be shared by email) is essentially a cheat sheet of each hazards and risks.
- Suggested mitigation based on Wood review of the risks and hazards will be incorporated and reviewed by jurisdictions.
- For specific questions on the action tracker, contact Jeff directly by email.
- For update/new Local Hazard Mitigation Plans: jurisdiction should start compiling mitigation actions and future plans and projects to be incorporated into the plan.
 - Incorporating these projects will help with acquiring grant funding later with those projects.
- For incorporating community wildfire protection plans (CWPP), jurisdictions don't need to completely regurgitate but signify high priority actions.
 - For example, capital improvement plans may include bridge upgrades.
 - Offer an annex to the CWPP.
 - When it comes to funding, jurisdictions need to specific in application.

8. Recommended New Mitigation Actions

- No new mitigation measures suggested at this time.

9. Questions and Answers/Adjourn

From: Jillian H. Ferguson <jferguson@co.slo.ca.us>
Sent: Thursday, April 25, 2019 4:11 PM
To: Jeffery Legato; Brislawn, Jeff P; Kip J. Morais; Joe Guzzardi; Scott Milner; Dave Flynn; Kate Ballantyne; Bryan Iwamoto; Francisco Pares; Mladen Bandov; Lynda Auchinachie; dt5314@gmail.com; slieberman_fivecitiesfire.org; Camilla Karamanlis; mdowning_arroyogrande.org; Tom Peterson; 'Casey Bryson'; jpeters@gdpd.org; sknuckles_morrobayca.gov; 'Matthew Vierra'; jstornetta_prcity.com; mgruver@pismobeach.org; Aggson, Keith; Maggio, Rodger; BHill_slocity.org; Read, Chris; Blattler, James; ','; rkoon_cayucosd.org; chrism_portsanluis.com; hagemann.associates_gmail.com; gm@groundsquirrelhollowcsd.org; scott@heritageranchcsd.com; rosborne@losososcscsd.org; Mlglesias_ncsd.ca.gov; Fireprevention@sanmiguelcsd.org; kelly.dodds@sanmiguelcsd.org; cmurguia@graceenviro.com; nicole@oceanocsd.org; 'Carey Casciola'; jbrilz@templetoncsd.org; Chief_templetoncsd.org; Gira, Daniel; Robert Fitzroy; jpeters_gbpd.org; tamara.parent@sanmiguelcsd.org; dcrawford@cayucosd.org; Alan.Peters_fire.ca.gov; wsiembie_calpoly.edu
Cc: Brislawn, Jeff P; Kip J. Morais; Scott Milner; Karen Nall
Subject: San Luis Obispo County HMP Update- Upcoming Mitigation Action Meeting reference materials
Attachments: 4_DRAFT Risk Summaries and Suggested Mitigation Handout.docx; 4_Typical Mitigation Action Items by Hazard.doc; 4_Typical Mitigation Actions by categories.doc; SLO HMP Public Survey Interim Results_190425.pdf; SLO HMP Update Meeting 4 Agenda.docx; Updated HMP Mitigation Action Tracker 4_25_19.xlsx

Good afternoon, HMPC members –

Thank you for a productive meeting this morning!

In preparation for the next HMPC meeting #4 on April 30th the following resources are provided for reference.

- Meeting agenda HMPC #4
- Updated Hazard Mitigation Action Tracker 4_25_19 - This has been updated with input from jurisdictions with an existing HMP received to date so you know what actions are being carried forward, deleted or modified. If your jurisdiction hasn't provided input on this please do so as soon as possible.
- Hazard Assessment Summary and Suggested Mitigation Handout – This recaps the key issues/problems identified in the updated hazard assessment; suggestions for possible new mitigation actions are noted from the Wood team by hazard as food for thought.
- Interim Public Survey Results - See pages 9-11 for a summary of general mitigation actions that are viewed as favorable by the public. This is still open until May 7th.

Hazard Mitigation Alternatives references

The following are provided to consider the alternatives when identifying ways to mitigate hazards:

Typical Mitigation Action Items by Hazard.doc – Matrix of potential ways to mitigate hazards identified in the HMP

Typical Mitigation Actions by categories.doc - Matrix of potential ways to mitigate, based on categories

recommended by the Community Rating System (flood focused, but multi-hazards applicable).

Handouts of these will be provided at the next HMPC meeting.

Other resources:

FEMA Mitigation Ideas publication – Highlights mitigation best practices by hazard

<https://www.fema.gov/media-library/assets/documents/30627>

Climate Adaptation –

California Adaptation Planning Guide (2012) provides step-by-step guidelines for local agencies to prepare for disasters associated with Climate Change and implement SB 379

http://resources.ca.gov/docs/climate/01APG_Planning_for_Adaptive_Communities.pdf

Safeguarding California Plan (2018) – this is the State’s implementation program to address climate change

<http://resources.ca.gov/climate/safeguarding/>

California Coastal Commission Sea Level Rise policy guidance (2018) for jurisdictions in the Coastal Zone

<https://www.coastal.ca.gov/climate/slrguidance.html>

Thank you!

Jillian Ferguson | Planner, Long Range Division

(p) 805-781-1391 jferguson@co.slo.ca.us

[Website](#) | [Facebook](#) | [Twitter](#) | [Map](#)



COUNTY OF SAN LUIS OBISPO
Planning & Building

SIGN-IN SHEET

SAN LUIS OBISPO COUNTY MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN UPDATE PROJECT

HMPC #4 – Mitigation Action Workshop

Tuesday, April 30, 2019 9:00 AM - Noon

Library Community Room 995 Palm St. San Luis Obispo, CA

Name	Jurisdiction/Agency/Dept	Title	Phone	E-mail
JONATHAN STORJETA	PRAD	CHIEF	805 371-5000	JSTORJETA@PRCITY.COM
Brian Lewis	PRAD	Regional Chief	635-5544	BLewis@PRCITY.COM
MIKE GRUNER	CITY OF PISMO BEACH	ASSOCIATE PLANNER	805 773-7090	MGRUNER@PISMOBEACH.ORG
Scott Milner	SLO County OES	Emergency Svcs. Coord.	(805) 781-4128	smilner@co.slo.ca.us
JAMES BLATTNER	SLO CITY	ADMIN ANALYST	805-781-7362	jblattner@slcity.org
TOM PETERSON	Atascadero Fire	Fire Marshal	(805) 538-9196	tompeterson@atascadero.org
SCOTT DUFFIELD	HERITAGE RANCH CSD	GM		
Rebecca Whiteside	SLO County Planning	GIS Analyst	805-781-1306	rwhiteside@co.slo.ca.us
Mychal Jones	S. SLO County San Dist.	Plant Super	805-489-6666	mychal@scbcasd.us
JEFF LEGATO	SLO CO - PLN	GIS ANALYST	781-5102	JLEGATO@CO.SLO.CA.US
Kylie Hensley	SLO County Planning	Planner	805 781 4979	khensley@co.slo.ca.us
Kip Morais	SLO County Planning	Planner	805 781-3436	kmorais@co.slo.ca.us
Dan Gilmore	Ground Sq. Hollow	GM	805 441-4428	gsm@groundsquihollowcsd.org

SIGN-IN SHEET
MULTI-JURISDICTIONAL HAZARD MITIGATION
HMPC #4 – Mitigation Action Workshop
Tuesday, April 30, 2019 9:00 AM - Noon
Library Community Room 995 Palm St. San Luis Obispo, CA

[illegible]



Learn About Hazards and Discuss Mitigation Action Strategies

County-Wide Local Hazard Mitigation Plan & Safety Element Update Public Workshop

April 30th | 5:30-7:30pm

**864 Santa Rosa St. San Luis Obispo
(Ludwick Community Center)**

Snacks Provided! Please attend!



Take our brief survey:

<https://www.surveymonkey.com/r/SLOHMPupdate>

COMMENT CARD

San Luis Obispo County Hazard Mitigation Plan Update: Public Workshop – April 30th, 2019

Please leave a comment related to the County's Hazard Mitigation Plan. Please provide your contact info if you would like to receive ongoing updates and information related to the HMP by email, phone, or mail.

Name (optional): CRAIG BALTIMORE

Email (optional): cbaltimo@calpoly.edu

Phone Number (optional): 805-756-6384

Mailing Address (optional):

Comment: "THERE IS A PERSONAL RESPONSIBILITY COMPONENT", THIS STATEMENT IS VERY TRUE, THIS INFORMATION TO THE PEOPLE IS HIGH PRIORITY. THE BEST PLAN ISN'T WORTH ANYTHING IF NO ONE KNOWS. INFORMATION GATHERING HAS CHANGED! THE NEWSPAPER IS NO LONGER. THE "APP" IS WHAT IS USED TO DISSEMINATE INFO. THE IS THE "APP" NEXT DOOR WHICH IS AN EXAMPLE. EASY IS KEY. HAV QUICKLY GET AN "APP" THAT DOESN'T "BLOW UP" MY PHONE. A SEASONAL REMINDER.

:)
NEW ACTION

Or fill out the brief Online Survey at: <https://www.surveymonkey.com/r/SLOHMPupdate>

Comment cards must be delivered to the comment box by the end of the Workshop.

If you have any questions, please contact Jillian Ferguson at 805-781-1391

jferguson@co.slo.ca.us

SIGN-IN SHEET
SAN LUIS OBISPO COUNTY MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN UPDATE PROJECT
Public Workshop
Thursday, April 30, 2019 5:30 PM – 7:30 PM
Ludwick Community Center 864 Santa Rosa St. San Luis Obispo, CA

Name	Citizen or Organization	Community	E-mail (optional)
Emily Miggins	LOS OSOS ESAC	Los Osos	emiggins@gmail.com
Ronald Smith	Los Osos	Los Osos	
TOM WRIGHT	LOS OSOS	Los Osos	TWRIGHT544@CHARRER.NET
TIM MURPHY	SLO COUNTY D.A.	PASO ROBLES	tmurphy@co.slo.ca.us
WANG BALTIMORE	LOS OSOS	Los Osos	cvbaltimore@gmail.com
Martha	SLO	SLO	
✓ SCOTT YOUNG	SAN MIGUEL FIRE	SMF	FIREPREVENTION@SANMIGUELCSO.ORG
✓ ROB ROBERSON	SAN MIGUEL FIRE	SAN MIGUEL	ROB.ROBERSON@SANMIGUELCSO.ORG
Camas Frank	Atascadero News	North Co.	cfrank@atascadonews.com
Dave Flynn	SLO		dfflynn2095@yahoo.com

SIGN-IN SHEET
SAN LUIS OBISPO COUNTY MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN UPDATE PROJECT
Public Workshop

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Ludwick Community Center 864 Santa Rosa St. San Luis Obispo, CA

[illegible]

COMMENT CARD

San Luis Obispo County Hazard Mitigation Plan Update: Public Workshop – April 30th, 2019

Please leave a comment related to the County's Hazard Mitigation Plan. Please provide your contact info if you would like to receive ongoing updates and information related to the HMP by email, phone, or mail.

Name (optional): TOM WRIGHT

Email (optional): TWRIGHT544@CHARTER.NET

Phone Number (optional):

Mailing Address (optional):

Comment: + FOR JEFF BOR SAFETY MESSAGE - COULD INCLUDE LOCATION OF AED - WHO CALLS 911
+ JEFF KEPT DISCUSSION ON TOPIC

Δ I HAVE BEEN STRANDED BY RAIN - NEVER BY DROUGHT - NO EVACUATIONS DUE TO DROUGHT

Δ LACK OF INITIAL PUBLIC INPUT - 94 RESPONSES - 250,000 PEOPLE

Or fill out the brief Online Survey at: <https://www.surveymonkey.com/r/SLOHMPupdate>

Comment cards must be delivered to the comment box by the end of the Workshop.

If you have any questions, please contact Jillian Ferguson at 805-781-1391

jferguson@co.slo.ca.us

+ = GOOD

Δ = NEEDS IMPROVEMENT



Community input crucial to Local Hazard Mitigation Plan updates

By:

[Kacey Drescher](https://www.keyt.com/meet-the-team/kacey-drescher/655929177) (https://www.keyt.com/meet-the-team/kacey-drescher/655929177)

✉ (mailto:kacey.drescher@keyt.com) **f** (https://www.facebook.com/kcdrescher) **t** (https://twitter.com/KEYTNC3Kacey)

Posted: Apr 30, 2019 10:45 PM PDT

Updated: May 01, 2019 02:30 AM PDT

SAN LUIS OBISPO COUNTY, Calif. - Our communities know all too well that natural disasters can strike at any time and officials want to make sure we're prepared for the unexpected.

Every five years, updates are made to our Local Hazard Mitigation Plan and for the first time, the plan will include all cities and jurisdictions throughout San Luis Obispo County.

A small crowd gathered at the Ludwick Community Center Tuesday and officials say community input is crucial to the process.

While fire is a hazard that hits close to home for many, the plan will look at a wide range of natural disasters, everything from tsunamis to agricultural pests.

"The Thomas Fire, that really got me motivated as a citizen and I stormed our local fire department," said Emily Miggins of Los Osos.

Miggins volunteers with her local emergency services advisory committee.

"Fire is my number one, I am very concerned. Obviously, drought is related, climate change is related," said Miggins.

The environmental scientist works closely with fire officials and feels like we could do a better job of getting the word out to citizens about updates to our Local Hazard Mitigation Plan.

"Estimated 250,000 residents in SLO County overall and we've had so far 94 responses to Wood PLC, which is the consultant," said Miggins.

Obviously, the San Miguel Community Services District's Fire Chief is keenly aware of our region's wildfire threat.

"We are a part of a master mutual aid plan where our resources will help out in other communities in the county and also what they can help provide us in the event of a disaster," said Rob Roberson, Fire Chief, San Miguel Community Services District.

Officials say these updates are about being proactive rather than reactive and fire and drought, earthquakes and evacuation are top of mind for the community.

"Any type of disaster that would overwhelm our resources in the district is one of the big concerns. We've had earthquakes in the past like in '03 and things could happen in the district that would really cripple us," said Roberson.

Community input is needed during this multi-jurisdictional effort to best identify the risks so we can develop a strategy to reduce those risks and lessen the hazardous impact.

Officials are hoping to have a draft out for public review by mid-July.



Mom Make Grave Mistake When She Takes Selfie In Her Daughter's Dorm Room

By Upbeat News

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California's Central Coast | *Everywhere*

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San Luis Obispo County prepares for future natural disasters

👤 Megan Healy 🕒 10:21 pm 📅 April 30, 2019



SLO County planners update hazard mitigation response plan



San Luis Obispo County is preparing for natural disasters and planners are asking for the community's help.

The county is looking for input on a Hazard Mitigation Plan that is updated every five years.

They are looking for ways to save lives and property in the event of fires, earthquakes, tsunamis, and other disasters.

Natural disasters can bring great destruction and the Central Coast is no stranger to it.

People in San Luis Obispo County say they're worried especially in the wake of recent deadly wildfires.

"How do we get more people involved so that they are prepared and so that my neighbor doesn't catch on fire and then these mass tracts of public land catch on fire," said Emily Miggins, a Los Osos resident.

San Luis Obispo County planners held a public meeting Tuesday looking for ways to decrease the impact of events like fires or mudslides.

The Planning and Building department is updating this plan so the county is better prepared if and when disaster strikes locally.

"We are looking at hazard mitigation actions or projects that would be proposed and to mitigate those hazards to mitigate damages and loss of life," said Scott Milner, the San Luis Obispo County Emergency Services Coordinator.

People ranked the risks they felt would be more catastrophic within San Luis Obispo County including fires, earthquakes and sea level rise hazards.

"To address sea level rise some of the projects might include seawalls and beach nourishment where you add sand to the beach," said Milner.

A member of the SLO County Farm Bureau brought up concerns for state and federal laws that might prevent farmers from reducing fire and flood risk on their lands.

^

"[Farmers] are good stewards of the land they are just not allowed to take care of it to help mitigate some of these hazards," said James Green, Government Affairs Specialist for the San Luis Obispo County Farm Bureau.

For the first time, the plan will include all jurisdictions in the county.

After they gather suggestions from the public, county planners will create a draft plan update.

We can expect to see that in July.

Tuesday night's meeting was the last public input meeting but community members can still submit comments here until May 7.



Megan Healy

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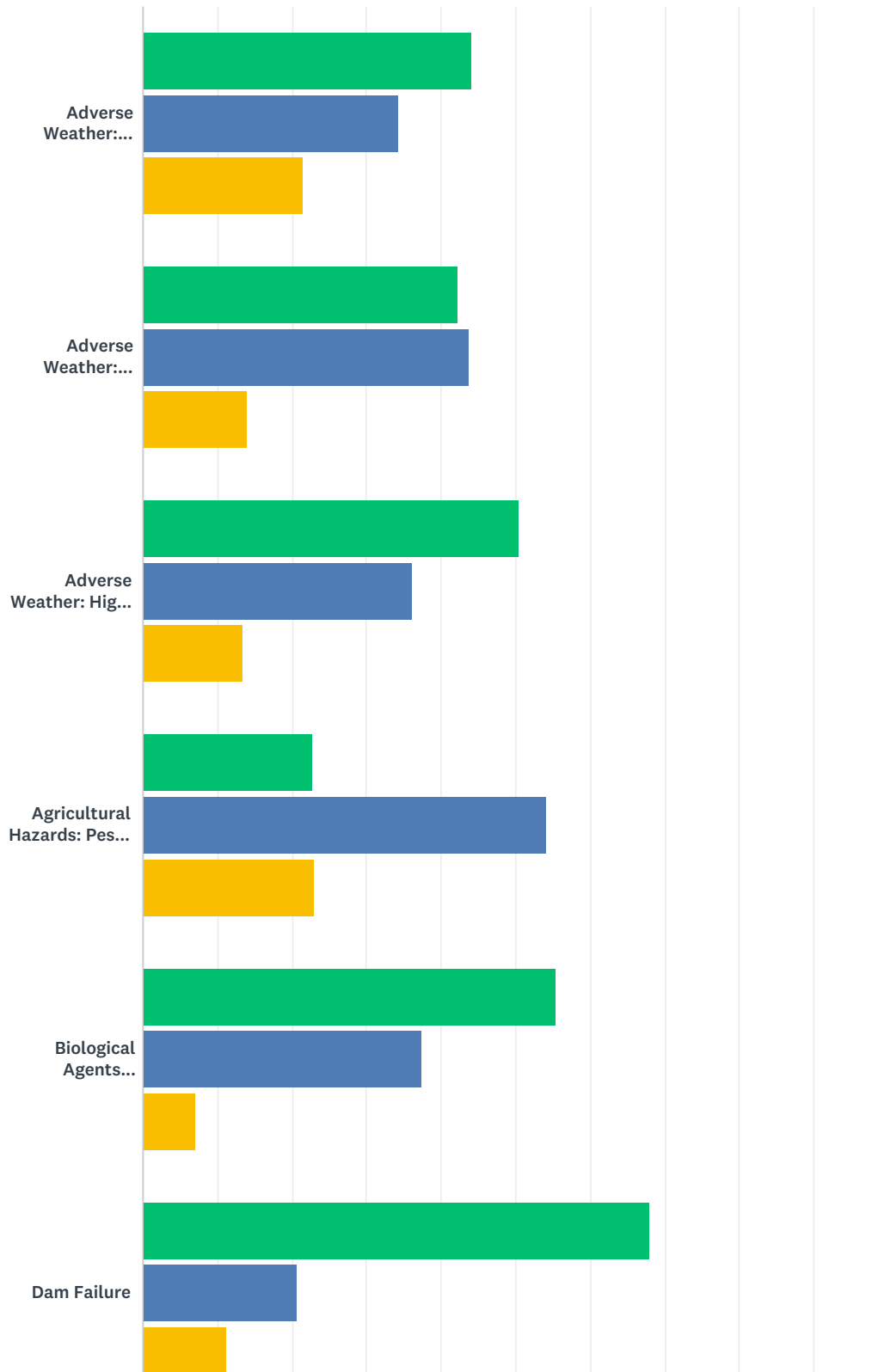
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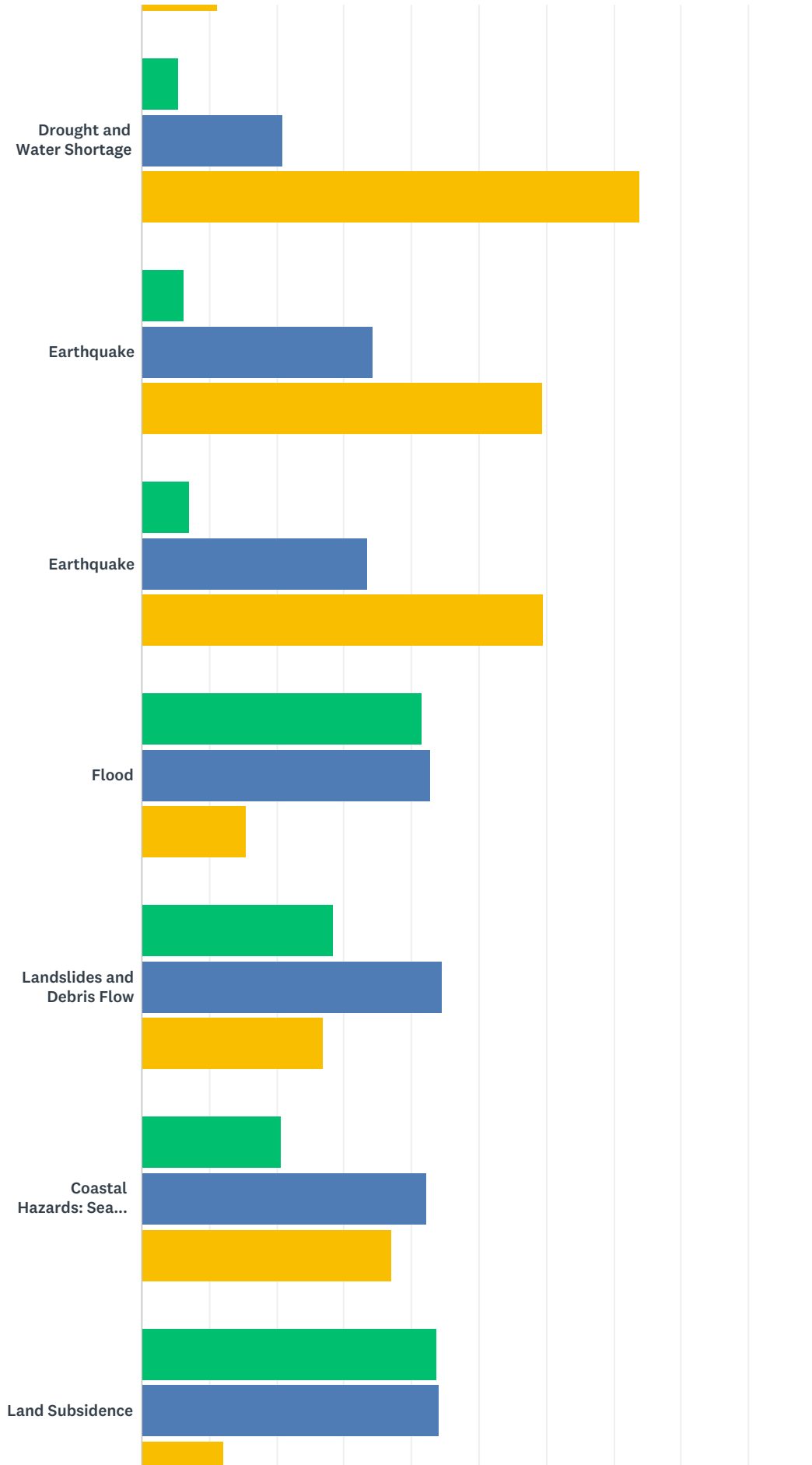


Q1 The hazards addressed in the Multi-Hazard Mitigation Plan update are listed below. Please indicate the level of significance in the County that you perceive for each hazard.

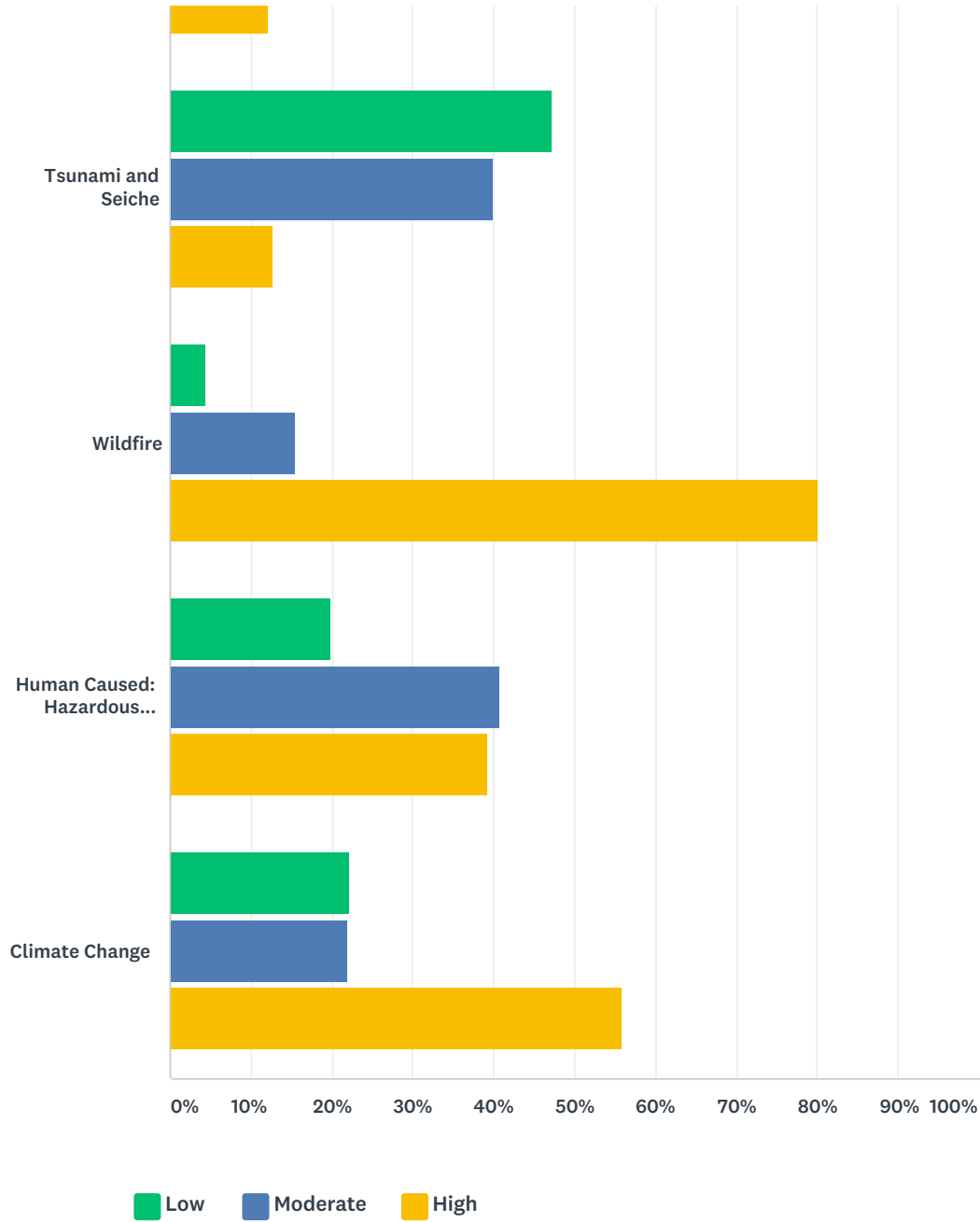
Answered: 319 Skipped: 2



San Luis Obispo County Hazard Mitigation Plan Update Public Input Survey



San Luis Obispo County Hazard Mitigation Plan Update Public Input Survey



	LOW	MODERATE	HIGH	TOTAL
Adverse Weather: Extreme Temperatures	44.13% 139	34.29% 108	21.59% 68	315
Adverse Weather: Thunderstorm/Heavy Rain/Hail/ Fog/Freeze	42.36% 133	43.63% 137	14.01% 44	314
Adverse Weather: High Wind/Tornado	50.48% 158	36.10% 113	13.42% 42	313
Agricultural Hazards: Pest Infestation/Plant Disease and Marine Invasive Species	22.76% 71	54.17% 169	23.08% 72	312
Biological Agents (naturally occurring)	55.52% 166	37.46% 112	7.02% 21	299
Dam Failure	68.06% 211	20.65% 64	11.29% 35	310

San Luis Obispo County Hazard Mitigation Plan Update Public Input Survey

Drought and Water Shortage	5.36% 17	20.82% 66	73.82% 234	317
Earthquake	6.35% 20	34.29% 108	59.37% 187	315
Earthquake	7.02% 21	33.44% 100	59.53% 178	299
Flood	41.61% 129	42.90% 133	15.48% 48	310
Landslides and Debris Flow	28.53% 89	44.55% 139	26.92% 84	312
Coastal Hazards: Sea Level Rise/Coastal Erosion/Coastal Storm	20.77% 65	42.17% 132	37.06% 116	313
Land Subsidence	43.73% 129	44.07% 130	12.20% 36	295
Tsunami and Seiche	47.27% 147	39.87% 124	12.86% 40	311
Wildfire	4.42% 14	15.46% 49	80.13% 254	317
Human Caused: Hazardous materials	19.94% 62	40.84% 127	39.23% 122	311
Climate Change	22.22% 70	21.90% 69	55.87% 176	315

Q2 Do you have information on specific hazard issues/problem areas that you would like the planning committee to consider? Note the jurisdiction to which it applies:

Answered: 155 Skipped: 166

#	RESPONSES	DATE
1	Old/dead eucalyptus trees Countywide	5/12/2019 3:48 PM
2	No	5/8/2019 10:09 AM
3	no	5/7/2019 11:03 AM
4	North Coast areas - mudslides due to unpermitted development on steel slopes, lack of enforcement of removal of pine trees and native vegetation leaving areas prone to slides, lack of planning for large crowd attendance at events in case of emergency, allowing roads to be closed for large events leaving neighborhoods vulnerable to being trapped in a wildfire or other emergency situation, lack of transparent land use and development planning leaving citizens unaware of future plans for developments in their neighborhoods, allowing new roads to be created under a false 'emergency' scenario such as the 'fire' road that was planned for Pineridge St. in Cambria when the road was actually required as part of the Air Force radar station development, stop installation of drains being installed in new development whereby storm water is allowed to runoff into the streets and into the Marine Sanctuary, SLO County is neglecting to hold public workshops and meetings in affected areas - instead the planning is done in the town of SLO with no local citizens able to attend the meetings, neglect to hold public workshops and meetings in conjunction with other agencies especially CA State Parks, CA Fish and Wildlife, the CA Coastal Commission and other significant agencies that regulate our area.	5/6/2019 11:47 AM
5	Diablo	5/6/2019 10:28 AM
6	Houseless people using fire in the forest. Cambria	5/6/2019 8:58 AM
7	Diablo Canyon Nuclear Plant - radioactivity (jurisdiction : human caused)	5/6/2019 8:48 AM
8	Light pollution	5/6/2019 1:37 AM
9	If a disaster - how do we get out of Los Osos	5/5/2019 5:41 PM
10	Cayucos Old Creek road hwy 1 area, pedestrian safety and speeding vehicles	5/5/2019 4:32 PM
11	no	5/5/2019 3:33 PM
12	The efficiency of collecting rain water with the CCSD in Cambria. More emphasis on wise progressive water usage...very sad to watch it flow into the ocean and then think we need high tech desalination plant	5/5/2019 3:11 PM
13	Cabrillo Estate and fire danger with all the eucalyptus trees	5/5/2019 2:00 PM
14	Fire safety is top priority at present	5/5/2019 7:26 AM
15	Cayucos crosswalk between On the Beach Hotel and Cayucos Surf Shop I had run off from hotel making it wet and slippery.	5/4/2019 10:46 PM
16	Yes my neighbor to 369 Saint Mary Ave has a fire hazard. A shed that is falling apart and a euclyptus tree that is in need of an aborist.	5/4/2019 9:44 PM
17	I would like to see more information to the county on the negative outcome from the use of hazzardous chemical products such as Roundup and bug poisons on our immediate environment specifically our neighborhoods and the negative impact it has on all species including our health, and the health of animals and other forms of life, ie bees and insects that protect the delicate mantle of our environment.	5/4/2019 9:07 PM
18	Wild fire in Cambria with large numbers of dead trees.	5/4/2019 8:15 PM
19	wildfires	5/4/2019 7:55 PM

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20	In Morro Bay we have very high grass and weed areas that have grown with the rains and have not been cut. This includes at the state park. This is a wildfire hazard.	5/4/2019 7:15 PM
21	no	5/4/2019 7:01 PM
22	Cayucos-evacuation in the event of a fire or earthquake	5/4/2019 6:50 PM
23	Sea Water rise, Morro Bay	5/4/2019 6:50 PM
24	Homeless encampment and needles left in public park, Los Osos.	5/4/2019 6:31 PM
25	Dry weed abatement lo	5/4/2019 1:24 PM
26	Fire hazzard areas that do not have adequate warning signage. For example: the end of Alamo Drive where people stand or park to enjoy the view and toss cigarette butts into the brush. A fire in that area has the potential of spreading, not only to the adjacent homes but up the hill into Montaña de Oro.	5/4/2019 12:30 PM
27	wildfire; Los Osos	5/4/2019 11:34 AM
28	exiting neighborhoods and towns with one way out in case of evacuation.	5/4/2019 10:27 AM
29	Fire safety and prevention	5/4/2019 9:53 AM
30	Drinking water treatment. I feel unsafe drinking Cambria water.	5/4/2019 9:46 AM
31	No	5/4/2019 8:42 AM
32	north coast	5/4/2019 8:32 AM
33	Fire/brush and tree removal/Los Osos	5/4/2019 8:11 AM
34	Fire Eucalyptus Trees, Montana de Oro	5/3/2019 10:27 PM
35	Los Osos, wildfires drought	5/3/2019 10:27 PM
36	Fire in Los Osos	5/3/2019 9:43 PM
37	no	5/3/2019 8:41 PM
38	A natural growth of eucalyptus trees way out of control	5/3/2019 6:56 PM
39	Cut down dead trees in SLO; bury power lines in SLO. The City and PG&E?	5/3/2019 6:00 PM
40	No	5/3/2019 5:45 PM
41	vacation rentals and lack of regulations to insure peace and quiet in neighborhoods. Los Osos	5/3/2019 5:33 PM
42	Fire fuel mitigation in Los Osos	5/3/2019 2:58 PM
43	Forest management to reduce fires==iCambria/North Coast	5/3/2019 2:52 PM
44	over growth of population / limited water	5/3/2019 10:37 AM
45	Fire hazard in Montana de Oro due to eucalyptus	5/3/2019 10:32 AM
46	Only one exit out of Cabrillo in Los Osos.	5/3/2019 9:20 AM
47	PG&E reports on wind/wildfire risks Templeton	5/3/2019 8:33 AM
48	Montana de Oro fire	5/3/2019 8:31 AM
49	Eucalyptus tree hazard	5/3/2019 8:18 AM
50	No	5/3/2019 8:07 AM
51	low lying coastal areas and fresh water storage	5/3/2019 7:52 AM
52	Yes, Los Osos	5/2/2019 11:53 PM
53	Fire hazard hills above LOVR controlled by Land Conservancy. They are doing nothing to litigate fire hazard. Trails have overgrown, dead wood has not been cleared, there has been no thinning of wooded area	5/2/2019 11:42 PM
54	Tsunami evacuation plans	5/2/2019 11:29 PM
55	Leak/damage at Diablo Nuclear Plant in Morro Bay	5/2/2019 9:07 PM
56	the eucalyptus tree fire threat at the south border of Cabrillo Estates/Monarch Grove on Los Osos	5/2/2019 8:42 PM

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57	It's all over the Internet; massive effects of climate change; sea level rise, warming temperatures, extreme storms, etc.	5/2/2019 7:52 PM
58	Diablo Canyon Nuclear waste disposal and release of Radioactive material into our environment	5/2/2019 7:46 PM
59	fire and drought and potable water shortages - Los Osos	5/2/2019 7:19 PM
60	Water quality in Cambria.	5/2/2019 5:14 PM
61	no	5/2/2019 5:02 PM
62	Spent nuclear fuel stored onsite at Diablo Canyon NCP is vulnerable to fires, climate change related weather, long term financial solvency of PG & E (think maintenance for the next 10,000 years or so) and terrorist attack.	5/2/2019 4:16 PM
63	Los Osos fresh water supply	5/2/2019 3:11 PM
64	Specifically to Los Osos--including the moving of the proposed Morro Bay sewer plant into the estuary watershed--please look at additional tech and procedures needed to protect the estuary.	5/2/2019 2:05 PM
65	Too much pesticide usage at wineries in Paso Robles. glyphosates etc.	5/2/2019 1:55 PM
66	land use planning - it will be very difficult to evacuate from los osos and water shortages trouble me greatly - therefore please recommend no additional building in los osos - to complicate both problems! thanks	5/2/2019 1:36 PM
67	People driving stupid.	5/2/2019 12:24 PM
68	Eucalyptus tree intrusion; lack of exit capability in case of emergency evacuation in Cabrillo Estates.	5/2/2019 12:21 PM
69	Wildfires - Los Osos	5/2/2019 12:04 PM
70	In San Luis Obispo County there is a concern with limit exit corridors in the event of a major event. Any large scale evacuation would be extraordinarily difficult to execute safely due to lack of roads as well as dense population and work centers.	5/2/2019 11:41 AM
71	Yes, Los Osos	5/2/2019 11:39 AM
72	Urban design, interface with wild lands, potential for fire, risk to safe evacuation in emergency condition.	5/2/2019 11:32 AM
73	Los Osos has many Eucalyptus trees behind homes on highland which will create a Severe threat to the entire town due to proximity to houses, height to launch embers, and pure volatile payload.	5/2/2019 9:42 AM
74	No.	5/2/2019 8:46 AM
75	Green space in Bay Oaks is overgrown with vegetation and dead trees. Definite fire hazard. Many homes located within 100 feet	5/2/2019 7:30 AM
76	Water....Why are we still building new homes with our water issues!	5/2/2019 5:25 AM
77	Fire and Wind are a terrible duo. With climate change drought conditions, those will be our highest forces of devastation this summer, at least.	5/2/2019 12:44 AM
78	Requirement to maintain and protect Morro manzanita even if within 5 feet of a structure.	5/2/2019 12:09 AM
79	If the Planning Committee can go along our Habitat Conservation Plan to be listed on the Federal Register more quickly, and we could get it approved, we could do a lot more than we are doing to reduce our high damage fire probability. We are hamstrung for now.	5/1/2019 11:13 PM
80	wildfire mitigation	5/1/2019 11:00 PM
81	no	5/1/2019 9:08 PM
82	PG&E and or SoCal Gas pipeline safety	5/1/2019 8:53 PM
83	No	5/1/2019 8:19 PM
84	Egress from Los Osos in any emergency. One road out is bad.	5/1/2019 7:53 PM
85	Highly flammable eucalyptus trees in Los Osos, specifically Cabrillo Estates, adjacent to Montana de Oro Cabrillo Estates/	5/1/2019 7:44 PM
86	Storm water runoff with unknown pollutants into the Estuary. Believe this is a county responsibility that is not being monitored nor reported on	5/1/2019 7:36 PM

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87	Concerned about climate change impacts locally, from increased pest issues to coastal flooding and higher sea levels. Very concerned about drought and increased development despite water issues likely to continue/reassert. Concerned about fire, but also about poor responses to such concerns (clearing hillsides of brush just leads to more possibilities for landslide/debris flow)	5/1/2019 6:19 PM
88	no	5/1/2019 5:47 PM
89	fire in Montana de Oro	5/1/2019 5:47 PM
90	Ass far as I know, coastal towns are not participating in requirements to devise plans for climate change/rising sea water.	5/1/2019 5:40 PM
91	Please consider evacuation issues from Los Osos.	5/1/2019 5:29 PM
92	Los Osos	5/1/2019 5:06 PM
93	Behind Highland fire danger.	5/1/2019 4:28 PM
94	No	5/1/2019 4:16 PM
95	Los Osos	5/1/2019 3:20 PM
96	Oak Reserve - CA State Parks	5/1/2019 2:42 PM
97	None	5/1/2019 1:42 PM
98	SRA Oak reserve that extends between the homes in Bay Oaks needs trees pruned appropitly to prevent fire ladders	5/1/2019 12:28 PM
99	Wildland/Urban interface fires, USFW, CSFW,SLO County,	5/1/2019 12:25 PM
100	Los Osos and wildfires	5/1/2019 12:11 PM
101	Los Osos	5/1/2019 10:17 AM
102	Highly populated evacuation routes and programmed directional via local Traffic Operations	5/1/2019 8:23 AM
103	No	4/30/2019 5:42 PM
104	Wildfire	4/28/2019 7:52 AM
105	Cannabis/Pot Growers, Nipomo/SLO County	4/26/2019 12:47 PM
106	Fire	4/25/2019 9:08 PM
107	Earthquake - Fire Departments and rescue	4/25/2019 12:20 AM
108	Rail/ highway hazardous materials incident	4/24/2019 10:49 PM
109	Wildfire areas. Preventative measures: sheep/goat grazing, help with brush pile burning on private land, low water usage even in good years.	4/24/2019 4:01 PM
110	Nuclear Waste stored on site at Diablo Canyon	4/24/2019 1:26 PM
111	Invasive species: Quagga Mussels in our lakes	4/24/2019 1:24 PM
112	Ground water depeletion - North County	4/24/2019 11:21 AM
113	no	4/23/2019 2:17 PM
114	Irish Hills open space fire hazard	4/1/2019 10:53 PM
115	Impacts of Climate Change on Central Coast	3/24/2019 6:28 PM
116	What to do with the vulnerable populations...ie...the elderly, homeless, etc.	3/21/2019 6:18 PM
117	no	3/20/2019 12:40 PM
118	Community Hazards	3/20/2019 11:06 AM
119	None	3/20/2019 6:43 AM
120	none	3/20/2019 5:42 AM
121	More water storage.	3/20/2019 5:37 AM
122	Los Osos	3/20/2019 4:43 AM
123	Fire	3/20/2019 12:58 AM

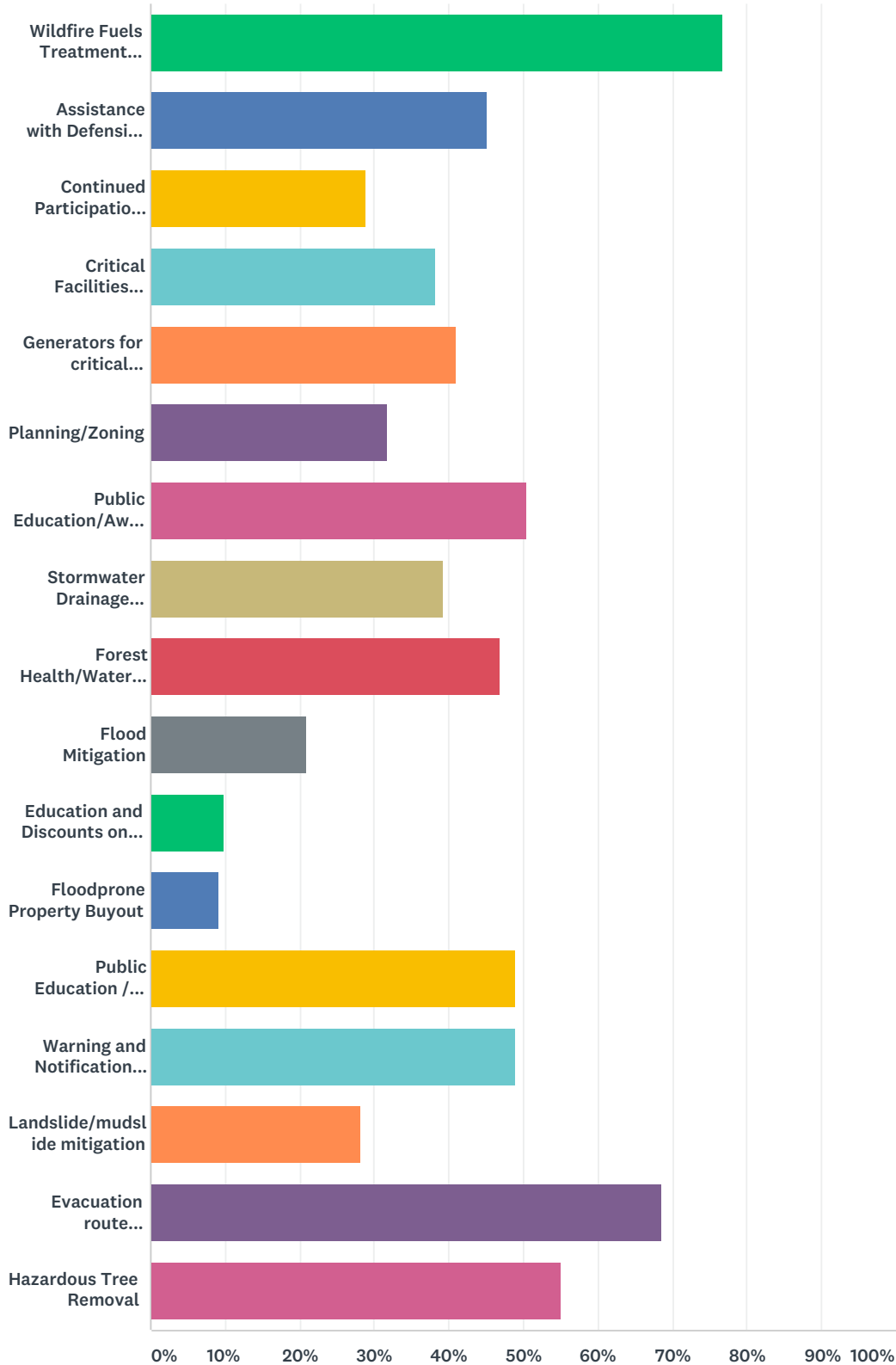
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124	Emergency notification of public	3/19/2019 11:54 PM
125	Resiliency to seismic event. We are no way prepared!!!	3/19/2019 11:34 PM
126	No	3/19/2019 6:02 PM
127	Phillips 66 Oil refinery, District 4 and Vandenberg	3/19/2019 5:42 PM
128	Any reference to the fraudulent "global warming" will denigrate the rest of the program.	3/19/2019 4:48 PM
129	DCPP nuke waste, Los Osos	3/18/2019 9:22 PM
130	civil war	3/18/2019 6:07 PM
131	Shelter-in-place instructions regarding a DCP event	3/18/2019 5:32 PM
132	no	3/18/2019 5:05 PM
133	Brush clearing is needed to reduce the spread of fire in the North County.	3/18/2019 4:20 PM
134	Only 1 freeway to evacuate area	3/18/2019 4:19 PM
135	Widespread infrastructure failure anywhere in the county	3/18/2019 12:47 PM
136	Price Canyon Oil	3/18/2019 12:30 PM
137	Whitley Gardens Flood Zone A vs X	3/18/2019 12:21 PM
138	The environmental impacts of plastic pollution. This issue effects our entire County.	3/18/2019 12:03 PM
139	highway access....too much traffic to evacuate in timely manner	3/18/2019 11:56 AM
140	No	3/18/2019 11:08 AM
141	No	3/17/2019 1:10 PM
142	Firestorm	3/15/2019 3:15 PM
143	trash and hypodermic needles by our creeks- san luis obispo	3/15/2019 9:53 AM
144	Upper Los Berros Rd in Nipomo is the only evacuation route for several families, and that's assuming it's clear of debris/fire/downed trees. In many places along the road, dead or dying trees lean directly over the road and have the potential to block the road should they fall. In the event of a fire, this could trap residents in the area.	3/14/2019 6:05 PM
145	N/A	3/14/2019 12:15 PM
146	Removal of dead trees throughout SLO County	3/14/2019 11:17 AM
147	No	3/14/2019 10:51 AM
148	Human feces in the streets,creeks, and public areas, and bio-hazards it creates	3/14/2019 9:50 AM
149	Emphasis on wildfires to the area	3/14/2019 9:29 AM
150	Economic collapse	3/14/2019 9:21 AM
151	No. Answers could change depending on many factors.	3/14/2019 7:52 AM
152	San Luis Obispo city interface with urban edge wildfire hazards, e.g. Cal Poly, Johnson Ave neighborhoods etc; earthquake & evacuation issues generally	3/14/2019 7:29 AM
153	Local watershed dam inspections may include seismic study. I believe this is all handled by the State Water Resource Control Board (SWRCB)	3/13/2019 9:31 PM
154	Countywide: homeless encampments polluting and causing fires.	3/13/2019 8:58 PM
155	Earthquake - SLO	3/13/2019 6:05 PM

Q3 The following types of mitigation actions may be considered in San Luis Obispo County. Please indicate the types of mitigation actions that you think should have the highest priority in the updated San Luis Obispo County Multi-Hazard Mitigation Plan.

Answered: 305 Skipped: 16

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ANSWER CHOICES	RESPONSES	
Wildfire Fuels Treatment projects	76.72%	234
Assistance with Defensible Space	45.25%	138
Continued Participation in the National Flood Insurance Program	28.85%	88

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Critical Facilities Protection	38.36%	117
Generators for critical facilities	40.98%	125
Planning/Zoning	31.80%	97
Public Education/Awareness	50.49%	154
Stormwater Drainage Improvements	39.34%	120
Forest Health/Watershed Protection	46.89%	143
Flood Mitigation	20.98%	64
Education and Discounts on Flood Insurance	9.84%	30
Floodprone Property Buyout	9.18%	28
Public Education / Awareness of hazards	48.85%	149
Warning and Notification Systems (Indoor and Outdoor)	48.85%	149
Landslide/mudslide mitigation	28.20%	86
Evacuation route development	68.52%	209
Hazardous Tree Removal	55.08%	168
Total Respondents: 305		

Q4 Please comment on any other pre-disaster strategies that the planning committee should consider for reducing future losses caused by natural disasters:

Answered: 121 Skipped: 200

#	RESPONSES	DATE
1	Just posted my suggestions in previous comments not knowing what questions were going to be asked next.	5/6/2019 11:48 AM
2	Flooding in low areas; need open and close dam. I.e; Cambria Dr/Highway 1. just an example.be opened, by phone or quickly from a point in the community that has the situation. I.e:	5/6/2019 10:38 AM
3	Monetary assistance for tree removal on private property.	5/6/2019 9:05 AM
4	Removal of radioactive storage containers from Diablo Canyon Nuclear Plant	5/6/2019 8:50 AM
5	None that i can think of	5/5/2019 5:42 PM
6	Phone & siren alerts please.	5/5/2019 5:30 PM
7	fire	5/5/2019 3:35 PM
8	Water	5/5/2019 3:12 PM
9	education regarding brush clearance	5/5/2019 2:02 PM
10	Prevent building in forested areas.	5/5/2019 8:35 AM
11	Early Warning Systems	5/5/2019 7:28 AM
12	Do you have a facebook page to post pre-disaster information for citizens?	5/4/2019 7:18 PM
13	community education	5/4/2019 7:01 PM
14	Earthquake prep	5/4/2019 6:54 PM
15	Evacuation routes and defensible space	5/4/2019 6:51 PM
16	Los Osos evacuation.	5/4/2019 6:33 PM
17	Please consider not just natural disasters but human caused disasters. Fire hazzard signage in critical areas and education of highschool students on the dangers of careless disposal of flammable materials and cigarettes.	5/4/2019 12:36 PM
18	keep suspect trees and brush clear, increase exits from areas with one way out.	5/4/2019 10:30 AM
19	Removal of all trees that can provoke fires	5/4/2019 9:55 AM
20	public education about climate change and effects in county	5/4/2019 8:34 AM
21	Evacuation routes for Los Osos residents	5/3/2019 10:30 PM
22	control burn, clearing of debris,	5/3/2019 10:28 PM
23	State regulations that impact fire safety planning	5/3/2019 9:44 PM
24	Removal of hazardous fire causing eucalyptus trees	5/3/2019 6:58 PM
25	Bury the power lines in SLO. Johnson Avenue!	5/3/2019 6:03 PM
26	Removal of wildfire fuels - underbrush, dead trees.	5/3/2019 5:47 PM
27	Establishment of shelters for evacuees to prevent injury and/or loss of life; provide authorities will means to determine impact of hazard/work to be done.	5/3/2019 3:04 PM
28	In Cambria, cut down dead or dying trees.	5/3/2019 2:44 PM
29	No more building on earthquake faults	5/3/2019 10:41 AM
30	Requiring utilities companies to bury lines	5/3/2019 9:33 AM

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31	Evacuation routes. Communities with only one exit	5/3/2019 8:33 AM
32	Eucalyptus tree removal without permit to reduce fire risk/fuel load	5/3/2019 8:22 AM
33	Emergency agency cooperation agreements	5/3/2019 7:54 AM
34	Assistance for hardening homes against fire - window replacement, vent covers	5/2/2019 11:56 PM
35	Development below hills with potential mudslides. Clean up of forests, especially the eucalyptus trees in Los Osos and Montana de Oro. Evacuate plans to include harbors and ports with the Coast Guard/US Navy should roads be impaired.	5/2/2019 11:35 PM
36	You seemed to have covered it. Diablo Nuclear Plant is a concern, but that is not a natural disaster; man made instead.	5/2/2019 9:12 PM
37	You already listed them.	5/2/2019 7:54 PM
38	Publish the prevailing wind patterns that we have in the Los Osos/Morro Bay Area so we know what the best route to take in case of the Radioactive release at the Diablo Canyon Power Plant	5/2/2019 7:51 PM
39	we need to protect the fragile water table	5/2/2019 7:20 PM
40	restore wetlands, restore shoreline habitats, zoning to disallow building in flood prone areas, fire prone areas and wetlands.	5/2/2019 6:33 PM
41	Forest Management in the Cambria Area. Removal of undergrowth and dead, standing trees. We don't want Cambria to burn down again.	5/2/2019 5:19 PM
42	none	5/2/2019 5:03 PM
43	Advocate for off site storage of spent nuclear fuel rods at Diablo Canyon NPP	5/2/2019 4:18 PM
44	Fresh water storage for Los Osos	5/2/2019 3:30 PM
45	Reduce carbon emissions; invest in green space and urban forestry	5/2/2019 2:52 PM
46	Concerns regarding Diablo and stored waste!! We need to go beyond what is the industry norm. Also, concern about Los Osos and the future Morro Bay sewer plants.	5/2/2019 2:09 PM
47	Education and drills in high risk areas.	5/2/2019 1:56 PM
48	no growth policies - so problems do not intensify -	5/2/2019 1:37 PM
49	evacuation capability for Los Osos	5/2/2019 12:23 PM
50	Education on evacuation planning	5/2/2019 12:10 PM
51	Healing watersheds and expanding forestry efforts, as well as regulation of grazing and agriculture so that it does not exacerbate hazards are essential.	5/2/2019 11:44 AM
52	Diablo Canyon strategy, fire and flood strategies	5/2/2019 11:40 AM
53	Cut down eucalyptus. Clear behind houses backing wild areas .	5/2/2019 9:45 AM
54	alternate routes for evacuation from Los Osos	5/2/2019 9:43 AM
55	Cutting back wildfire fuels	5/2/2019 8:47 AM
56	Cleaning up the dead brush and trees in green space, to prevent fires from natural disasters such as gas line explosions due to earthquakes, as well as wildfires.	5/2/2019 7:37 AM
57	Have classes to teach people. Have mock drills!	5/2/2019 5:27 AM
58	Remove fire debris, not necessarily trees, but the debris around them as well as homes debris areas..	5/2/2019 12:48 AM
59	Sea level rise	5/2/2019 12:30 AM
60	Educate homeowners in high building density areas how they can protect their homes against fires.	5/1/2019 11:15 PM
61	Deforestation	5/1/2019 9:15 PM
62	No building in flood or sea level rising areas. And fire mitigation.	5/1/2019 7:54 PM
63	Evacuation routes from Los Osos and educate re designated emergency shelters	5/1/2019 7:45 PM

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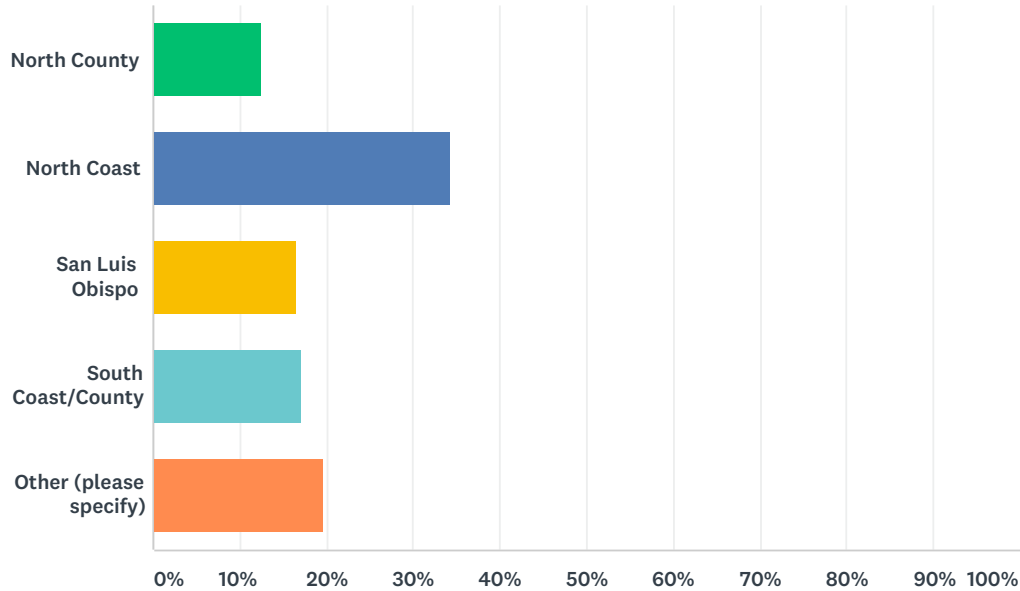
64	Is there a plan for biological or chemical sabotage	5/1/2019 7:40 PM
65	Evacuation routes out of Los Osos, which has limited road access	5/1/2019 7:06 PM
66	Tight coordination between cities and the county, and looking at our county more holistically, alongside strong awareness that bad things can and do happen in clusters. Repeated worst-case scenario analysis is necessary, and a willingness to think the unthinkable and then plan for it. We have some areas of very tight geography, such that evacuations will be difficult even in the best of circumstances. We have a high likelihood of fire, a tendency to drought and the potential for tapped-out wells, which would reduce firefighting capabilities. (We also cannot assume state water will be available in the future; it will depend on weather patterns and population patterns and policy decisions elsewhere.) We have local areas that high rain events could flood out quickly, blocking key roads for exit. We have steep slopes that can and do slip. We have the potential for residents to be displaced from the coasts due to rising sea levels, pushing more people to inland areas of the county, further taxing potential evacuation routes there in the event of a disaster, and possibly removing some coastal routes from evacuation maps. (Highway 1 already can't be relied on north of Cambria, due to its ongoing longtime tendency to try to fall into the ocean.) Structure fires can occur and spread in the middle of flood events, debris flow events, and tsunami events. Tsunami impacts will change if sea levels rise, something else that should be modeled and planned for. Etc. Our conversations about development tend to overlook these issues, how interconnected they are, and how they can be exacerbated by rising population generally, and by particular population increases or shifts in specific areas of the county.	5/1/2019 6:51 PM
67	Earthquake related issues scare me the most.	5/1/2019 5:31 PM
68	CERT training?	5/1/2019 5:07 PM
69	Brush and dead tree removal on both private and public land.	5/1/2019 4:30 PM
70	The unhoused population, foot and bicycle travelers, RV tourist parks, those living in vehicles, undocumented renters living in garages and such.	5/1/2019 3:24 PM
71	A robust wildfire fuel reduction program removing debris from all trees near homes and other structures at least once a year	5/1/2019 2:48 PM
72	Earthquakes are a large issue for us on the central coast because our evacuation choices are limited. How can we stay On our property and have resources for food and water	5/1/2019 2:19 PM
73	Get rid of fuel storage at Diablo	5/1/2019 1:35 PM
74	I have had emergencies from sever weather (rain) drought has not been an "emergency" situation	5/1/2019 12:27 PM
75	I think so much needs to be done with regular and consistent outreach to residents re: disaster preparedness. I feel strongly the county is failing, as well as jurisdictions.	5/1/2019 10:20 AM
76	No comment	4/30/2019 5:44 PM
77	Public notifications/ warning systems	4/28/2019 7:55 AM
78	Firestorm	4/27/2019 7:53 PM
79	List of designated Command Stations for Emergency information or supplies for each Town or City.	4/26/2019 12:56 PM
80	flooding	4/25/2019 9:09 PM
81	Better Earthquake Alarms	4/25/2019 12:22 AM
82	Encourage private landowners to manage their property for fuels management.	4/24/2019 10:53 PM
83	Help with brush pile burning on private property. Low usage of water even in good years	4/24/2019 4:02 PM
84	Preparedness workshops held in neighborhoods... lists of resources available to assist people so they are prepared	4/24/2019 1:29 PM
85	Do not allow over building in hazard zones. New developments have crowed the homes so close together with so many dead end streets that evacuation is difficult at best. Zoning with SAFETY FIRST rather economic incentive first is a must!	4/24/2019 11:26 AM
86	none	4/23/2019 2:19 PM
87	Agressive reduction of greenhouse gas emissions	3/24/2019 6:29 PM
88	CERT	3/20/2019 4:07 PM

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89	Strategy to make Hw 41 and 101 one way to facilitate evacuations.	3/20/2019 12:44 PM
90	CERT should have more exposure	3/20/2019 11:09 AM
91	None	3/20/2019 6:43 AM
92	Evac plan for Los Osos.	3/20/2019 4:45 AM
93	The county needs to partner with experts in the engineering field to help asses the risk of seismic disaster as to loss of buildings and life.	3/19/2019 11:36 PM
94	Tsunami flood zone signage	3/19/2019 5:46 PM
95	Maintain an online data base of potential hazards with mitigation suggestions.	3/19/2019 4:51 PM
96	Trailer stocked w MREs; water; bedding to distribute in event of an warranted emergency	3/19/2019 1:18 PM
97	fund more CERT classes for county residents	3/19/2019 11:01 AM
98	Coordinate with the San Luis Obispo Emergency Communications Council (SLOECC) for disaster communications.	3/18/2019 5:35 PM
99	County-wide disaster drills	3/18/2019 5:07 PM
100	Creating fire breaks throughout the county.	3/18/2019 4:21 PM
101	Education of public to plan to take care of themselves	3/18/2019 4:21 PM
102	CERT Team training and drills	3/18/2019 12:49 PM
103	Decarbonization and microgrids	3/18/2019 12:33 PM
104	Reduce interference in property ownership.	3/18/2019 12:23 PM
105	No where in this survey is mentioned addressing the issue of climate change through GHG emission reductions/decarbonization. I am all for reacting to the problem but we also have to address what is causing the issues in the first place. Simply reacting to the hazards without addressing the cause is similar to pumping water out of a sinking boat without patching the hole. Please consider a GHG reduction plan that coincides with pre-disaster planning.	3/18/2019 12:09 PM
106	don't let development happen until AFTER infrastructure in place. Make Costco\Target pay for bridges etc.	3/18/2019 11:58 AM
107	CERT Program is important for community ED	3/17/2019 1:11 PM
108	Brush/tree maintenance, clear evacuation route markers, emergency alerts/sirens in areas where cell service is minimal/nonexistent	3/14/2019 6:09 PM
109	WUI -Wildfire Urban Infrastructure prep for urban fires	3/14/2019 3:40 PM
110	The planning committee should seriously factor in the impact of Cal Poly students if the university administration fails on their end to lower risks and keep the student body calm	3/14/2019 12:19 PM
111	Revival of CERT classes	3/14/2019 11:20 AM
112	Food Bank	3/14/2019 10:54 AM
113	education in schools. Children are home alone and need to be just as aware and prepared	3/14/2019 9:52 AM
114	Evacuation routes for people living in Los Osos	3/14/2019 9:32 AM
115	Self preparedness/sufficiency for delayed response time aka prepping	3/14/2019 9:23 AM
116	safe housing is an issue in SLO. In the event of a natural disaster, these structures often overcrowded with tenants have increased risk of injury/death due to sub-standard housing.	3/14/2019 8:39 AM
117	Potential of advanced traffic logic for evacuation strategies	3/14/2019 8:24 AM
118	Prioritize effective communication (both btw responders/responsible staff, and with public)	3/14/2019 7:32 AM
119	More outreach on specific hazards "flood" "wild fire" and how people can understand what the next steps will be for them in certaint instances	3/13/2019 9:33 PM
120	Better brush management. Replant lost oaks.	3/13/2019 9:00 PM
121	Developing resiliency	3/13/2019 6:06 PM

Q5 How would you describe the region where you reside?

Answered: 304 Skipped: 17



ANSWER CHOICES	RESPONSES	
North County	12.50%	38
North Coast	34.21%	104
San Luis Obispo	16.45%	50
South Coast/County	17.11%	52
Other (please specify)	19.74%	60
TOTAL		304

#	OTHER (PLEASE SPECIFY)	DATE
1	N/A	5/7/2019 9:39 PM
2	Los Osos	5/7/2019 5:20 AM
3	New here - live in Los Osos - would this be south coast?	5/5/2019 5:43 PM
4	Los Osos	5/5/2019 5:31 PM
5	Cabrillo Estates north of Montana de Oro State Park	5/5/2019 2:03 PM
6	Coastal San Luis	5/5/2019 7:30 AM
7	Los Osos/Morro Bay	5/4/2019 8:00 PM
8	Los Osos	5/4/2019 3:59 PM
9	Los osos	5/4/2019 2:07 PM
10	Los Osos Coastal area	5/4/2019 1:44 PM
11	Mid Coast/Los Osos	5/4/2019 11:36 AM
12	central coast and bay	5/4/2019 10:31 AM
13	Morro Bay/Los Osos	5/4/2019 8:12 AM

San Luis Obispo County Hazard Mitigation Plan Update Public Input Survey

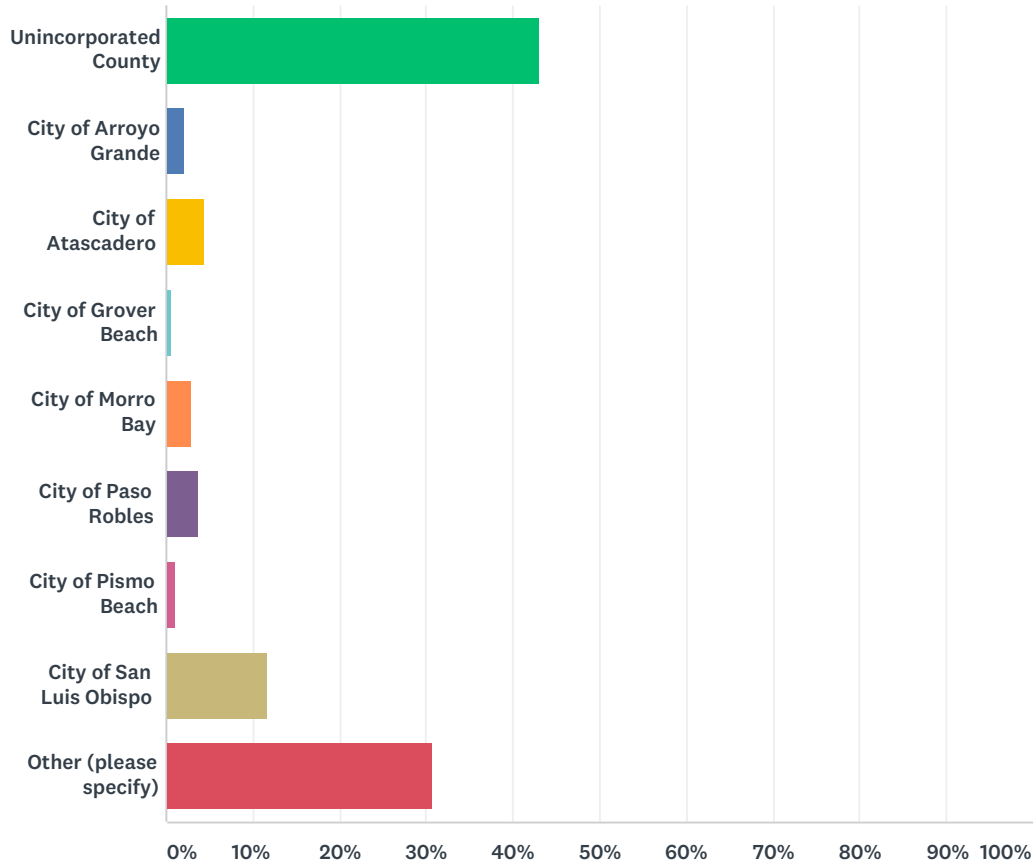
14	Los Osos	5/3/2019 11:33 PM
15	Central Coast Estero Bay	5/3/2019 10:29 PM
16	Los Osos	5/3/2019 7:41 PM
17	Los Osos	5/3/2019 7:22 PM
18	Central SLO county coast	5/3/2019 5:48 PM
19	Central Coastal area	5/3/2019 5:34 PM
20	Central coast	5/3/2019 2:29 PM
21	Coast	5/3/2019 10:33 AM
22	Los Osos	5/3/2019 8:23 AM
23	Los Osos/South Bay	5/2/2019 11:56 PM
24	Los Osos Above los osos valley rd, adjacent to Land Conservancy property	5/2/2019 11:45 PM
25	central coast (Los Osos)	5/2/2019 8:29 PM
26	Los Osos	5/2/2019 2:44 PM
27	Los Osos	5/2/2019 12:24 PM
28	Morro Bay /Los Osos	5/2/2019 12:11 PM
29	Los Osos	5/2/2019 12:05 PM
30	On Morro Bay	5/2/2019 10:45 AM
31	Los Osos south coast?	5/2/2019 9:45 AM
32	Los Osos	5/2/2019 8:48 AM
33	Los Osos	5/2/2019 7:38 AM
34	Coastal/Los Osos	5/2/2019 12:49 AM
35	Central Coast	5/1/2019 11:03 PM
36	Los Osos	5/1/2019 10:59 PM
37	Los Osos	5/1/2019 10:06 PM
38	Los Osos	5/1/2019 9:15 PM
39	Los Osos	5/1/2019 7:57 PM
40	Estero Bay District==Los Osos, Morro Bay, Cayucos	5/1/2019 7:46 PM
41	Los Osos	5/1/2019 7:06 PM
42	Los Osos	5/1/2019 5:49 PM
43	Los Osos	5/1/2019 5:09 PM
44	Los Osos. Middle coast	5/1/2019 4:30 PM
45	Estero Bay	5/1/2019 3:24 PM
46	Los Osos	5/1/2019 2:49 PM
47	Los Osos. Central coastal	5/1/2019 2:19 PM
48	Los Osos/Baywood Park	5/1/2019 1:57 PM
49	Los Osos	5/1/2019 1:35 PM
50	Los Osos	5/1/2019 12:29 PM
51	Los Osos	5/1/2019 12:27 PM
52	Central coast	5/1/2019 10:42 AM
53	SB County	5/1/2019 8:24 AM
54	Five Cities	4/30/2019 5:44 PM

San Luis Obispo County Hazard Mitigation Plan Update Public Input Survey

55	Nipomo	4/26/2019 12:56 PM
56	Los Osos	3/20/2019 12:44 PM
57	Los Osos (which I don't consider North Coast)	3/18/2019 9:25 PM
58	Live in north county, work on North Coast.	3/18/2019 11:59 AM
59	SB County	3/14/2019 8:25 AM
60	North County work 70 hr weeks SLO.	3/14/2019 7:56 AM

Q6 Indicate the community where you live

Answered: 300 Skipped: 21



ANSWER CHOICES		RESPONSES	
Unincorporated County		43.00%	129
City of Arroyo Grande		2.00%	6
City of Atascadero		4.33%	13
City of Grover Beach		0.67%	2
City of Morro Bay		3.00%	9
City of Paso Robles		3.67%	11
City of Pismo Beach		1.00%	3
City of San Luis Obispo		11.67%	35
Other (please specify)		30.67%	92
TOTAL			300

#	OTHER (PLEASE SPECIFY)	DATE
1	Los Osos	5/12/2019 3:55 PM
2	Los Osos	5/9/2019 3:52 PM

San Luis Obispo County Hazard Mitigation Plan Update Public Input Survey

3	Cambria	5/8/2019 10:15 AM
4	N/A	5/7/2019 9:39 PM
5	Los Osos	5/6/2019 9:38 PM
6	City of Los Osos	5/6/2019 11:07 AM
7	Cayucos	5/6/2019 8:51 AM
8	Los Osos / Baywood	5/5/2019 5:46 PM
9	Cayucos	5/5/2019 4:33 PM
10	Los Osos	5/5/2019 2:03 PM
11	Los Osos	5/5/2019 8:48 AM
12	Cayucos	5/4/2019 9:45 PM
13	Cambria, California	5/4/2019 9:09 PM
14	Los Osos	5/4/2019 8:17 PM
15	Cambria	5/4/2019 8:16 PM
16	Avila Valley	5/4/2019 7:57 PM
17	Cambria	5/4/2019 7:01 PM
18	Los Osos	5/4/2019 2:08 PM
19	Los Osos	5/4/2019 1:48 PM
20	Los Osos	5/4/2019 12:39 PM
21	Cambria	5/4/2019 12:24 PM
22	Cambria	5/4/2019 11:48 AM
23	Los Osos	5/4/2019 10:32 AM
24	cambria	5/4/2019 10:10 AM
25	Los Osos	5/4/2019 9:55 AM
26	Los Osos	5/4/2019 8:44 AM
27	Cambria	5/4/2019 12:26 AM
28	Cambria	5/4/2019 12:12 AM
29	Los Osos	5/3/2019 11:34 PM
30	Los Osos	5/3/2019 10:31 PM
31	Los Osos	5/3/2019 8:54 PM
32	Los Osos	5/3/2019 8:47 PM
33	Los Osos	5/3/2019 8:34 PM
34	Los Osos	5/3/2019 7:41 PM
35	Los Osos	5/3/2019 7:33 PM
36	Los Osos	5/3/2019 7:23 PM
37	Los Osos	5/3/2019 5:35 PM
38	Los Osos	5/3/2019 10:34 AM
39	Templeton	5/3/2019 9:35 AM
40	Los Osos	5/3/2019 8:24 AM
41	Los Osos	5/3/2019 8:14 AM
42	Los Osos	5/3/2019 7:26 AM
43	Cayucos, unincorporated county	5/2/2019 9:14 PM

San Luis Obispo County Hazard Mitigation Plan Update Public Input Survey

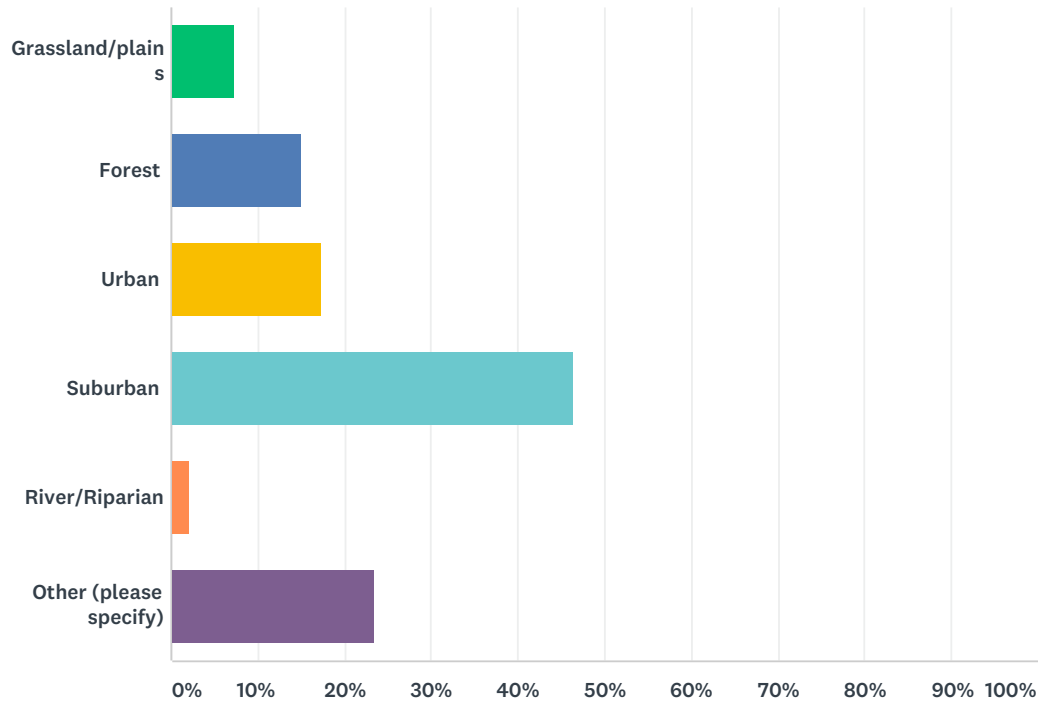
44	Los Osos	5/2/2019 8:45 PM
45	Los Osos/ Baywood park	5/2/2019 7:53 PM
46	Los Osos	5/2/2019 7:21 PM
47	Los Osos	5/2/2019 6:34 PM
48	Cambria	5/2/2019 5:20 PM
49	Los Osos	5/2/2019 5:05 PM
50	Los Osos	5/2/2019 2:01 PM
51	Los Osos	5/2/2019 1:46 PM
52	Los Osos	5/2/2019 1:37 PM
53	Los Osos	5/2/2019 12:26 PM
54	Los Osos	5/2/2019 12:24 PM
55	Los Osos	5/2/2019 12:14 PM
56	Los Osos	5/2/2019 11:41 AM
57	Los Osos	5/2/2019 9:47 AM
58	Los Osos	5/2/2019 7:40 AM
59	Los Osos	5/2/2019 12:31 AM
60	Los Osos	5/2/2019 12:11 AM
61	Los Osos/Baywood Park	5/1/2019 11:04 PM
62	Los Osos	5/1/2019 9:16 PM
63	Los Osos	5/1/2019 8:43 PM
64	Los Osos	5/1/2019 8:21 PM
65	Los Osos	5/1/2019 7:58 PM
66	Los Osos	5/1/2019 7:46 PM
67	Los Osos	5/1/2019 6:40 PM
68	Los Osos	5/1/2019 5:43 PM
69	Los Osos	5/1/2019 5:42 PM
70	Los Osos	5/1/2019 5:32 PM
71	Los Osos	5/1/2019 5:10 PM
72	Los Osos	5/1/2019 4:31 PM
73	Los Osos	5/1/2019 4:18 PM
74	Los Osos	5/1/2019 2:50 PM
75	Los Osos	5/1/2019 2:20 PM
76	Los Osos	5/1/2019 1:57 PM
77	Los Osos	5/1/2019 1:36 PM
78	Los Osos	5/1/2019 12:30 PM
79	Los Osos	5/1/2019 12:28 PM
80	Los Osos	5/1/2019 10:22 AM
81	Orcutt	5/1/2019 8:25 AM
82	Town of Nipomo (Why is this taxpaying community not listed?)	4/26/2019 1:00 PM
83	Los Osos	3/20/2019 12:45 PM
84	Los osos	3/19/2019 6:03 PM

San Luis Obispo County Hazard Mitigation Plan Update Public Input Survey

85	Templeton	3/19/2019 1:19 PM
86	Los Osos	3/18/2019 9:26 PM
87	Unincorporated county, west of Paso Robles	3/18/2019 4:22 PM
88	Nipomo Canyon	3/14/2019 6:11 PM
89	Los Osos	3/14/2019 1:09 PM
90	Los Osos	3/14/2019 9:37 AM
91	Orcutt, CA	3/14/2019 8:25 AM
92	sb	3/14/2019 7:37 AM

Q7 Please indicate the type of environment you reside in.

Answered: 299 Skipped: 22



ANSWER CHOICES	RESPONSES	
Grassland/plains	7.36%	22
Forest	15.05%	45
Urban	17.39%	52
Suburban	46.49%	139
River/Riparian	2.01%	6
Other (please specify)	23.41%	70
Total Respondents: 299		

#	OTHER (PLEASE SPECIFY)	DATE
1	Suburban against forest/open space	5/12/2019 3:55 PM
2	Hillside next to forest	5/9/2019 3:52 PM
3	Hillside	5/8/2019 10:15 AM
4	N/A	5/7/2019 9:39 PM
5	Rural	5/7/2019 5:21 AM
6	Coastal chaparral	5/6/2019 9:22 AM
7	Rural coast	5/5/2019 5:32 PM
8	Cambria	5/5/2019 3:13 PM
9	Coastal land	5/5/2019 8:48 AM

San Luis Obispo County Hazard Mitigation Plan Update Public Input Survey

10	Coastal beach	5/5/2019 7:31 AM
11	Beach community	5/4/2019 7:24 PM
12	Coastal	5/4/2019 7:19 PM
13	Coastal chaparral, Los Osos.	5/4/2019 6:36 PM
14	Coastal	5/4/2019 3:29 PM
15	Edge of Elfin Forest	5/4/2019 2:08 PM
16	Coastal (residential)	5/4/2019 1:48 PM
17	Los Osos	5/4/2019 1:33 PM
18	Protected Morro Manzanita area	5/4/2019 12:39 PM
19	Coastal hills	5/4/2019 11:37 AM
20	Coastal	5/3/2019 10:31 PM
21	Coastal range/adjacent to Green space	5/3/2019 10:31 PM
22	Near bay	5/3/2019 8:34 PM
23	coastal	5/3/2019 7:23 PM
24	Coast	5/3/2019 5:37 PM
25	Coastal	5/3/2019 2:30 PM
26	nuclear disaster zone / suburban	5/3/2019 10:44 AM
27	Whatever you call Los Osos	5/3/2019 9:52 AM
28	Hills/forested w grasslands	5/3/2019 9:35 AM
29	rural	5/3/2019 7:26 AM
30	Urban/Wildland interface	5/2/2019 11:57 PM
31	Rural	5/2/2019 11:45 PM
32	Beach	5/2/2019 9:14 PM
33	Mountain	5/2/2019 7:26 PM
34	coastal dune	5/2/2019 5:05 PM
35	Near open space	5/2/2019 4:18 PM
36	Coastal dunes	5/2/2019 2:59 PM
37	wildland urban interface	5/2/2019 1:37 PM
38	Edge of urban reserve, 1/2 mile to residential areas, pigmy oak hillside	5/2/2019 12:14 PM
39	Urban/open space interface area	5/2/2019 11:45 AM
40	South end of Morro Estuary	5/2/2019 11:41 AM
41	On Morro Bay	5/2/2019 10:46 AM
42	backing onto CSD leach field property	5/2/2019 9:46 AM
43	Coastal hills/mountains	5/2/2019 9:45 AM
44	Hills by Montana de Oro	5/2/2019 8:49 AM
45	Oak trees, grass and shrubs.	5/2/2019 7:40 AM
46	Coastal shrub and 5000 homes along coast. Euc forests & grassy hills.	5/2/2019 12:52 AM
47	Coastal	5/1/2019 10:07 PM
48	coastal sage	5/1/2019 9:43 PM
49	Coastal	5/1/2019 9:16 PM
50	Coastal	5/1/2019 9:02 PM

San Luis Obispo County Hazard Mitigation Plan Update Public Input Survey

51	Tideland/Riparian	5/1/2019 8:43 PM
52	coastal area	5/1/2019 8:21 PM
53	Hills open space adjacent	5/1/2019 7:49 PM
54	Los Osos is surrounded by a greenbelt of brush and forest	5/1/2019 7:24 PM
55	rural Los Osos	5/1/2019 5:52 PM
56	coastal	5/1/2019 5:42 PM
57	Adjacent to an oak forest and dune shrub/grasslands	5/1/2019 5:08 PM
58	Rural coastal	5/1/2019 2:20 PM
59	Rural, with trees and grassland	5/1/2019 12:28 PM
60	Coastal Chaparral, Urban/Wilderness interface	5/1/2019 10:22 AM
61	Mesa/Rural with mostly family residence vs farming.	4/26/2019 1:00 PM
62	Oak Savana	4/25/2019 12:23 AM
63	River & Creek adjacent in mouth of small canyon	4/24/2019 11:27 AM
64	Ranch. Mix of orchards, grasslands, and oak woodlands	4/19/2019 8:05 PM
65	Wildland urban interface	3/19/2019 11:58 PM
66	Agricultural/mesa	3/19/2019 5:47 PM
67	Oak woodland/canyon/creek	3/18/2019 10:57 PM
68	Rolling hills, grassland, and dense chemise.	3/18/2019 4:22 PM
69	trailer park	3/18/2019 12:00 PM
70	bay	3/14/2019 1:09 PM

**SAN LUIS OBISPO COUNTY MULTI-JURISDICTIONAL HAZARD
MITIGATION PLAN**

2019 UPDATE

MEETING #4 Mitigation Action Workshop

Tuesday, April 30th, 2019

9:00 – noon

**Library Community Room
995 Palm St., San Luis Obispo, CA**

- 1. Introductions**
- 2. Review of possible mitigation activities, alternatives, and related climate adaptation strategies**
- 3. Discuss criteria for mitigation action selection and prioritization**
- 4. Brainstorming Session: development of new mitigation actions**
- 5. New mitigation action implementation**
- 6. Prioritize mitigation actions (group process)**
- 7. Discuss plan implementation and maintenance**
- 8. Public Involvement Update**
- 9. Discuss next steps/Questions and Answers/Adjourn**

From: Jillian H. Ferguson [jferguson@co.slo.ca.us]
Sent: Thursday, April 25, 2019 3:28 PM

To: Jeffery Legato; Brislawn, Jeff P; Kip J. Morais; Joe Guzzardi; Scott Milner; Dave Flynn; Kate Ballantyne; Bryan Iwamoto; Francisco Pares; Mladen Bandov; Lynda Auchinachie; dt5314@gmail.com; Steve Lieberman; Camilla Karamanlis; Matt Downing; Tom Peterson; 'Casey Bryson'; jpeters@gdpc.org; sknuckles_morrobayca.gov; 'Matthew Vierra'; jstornetta_prcity.com; mgruver@pismobeach.org; Aggson, Keith; Maggio, Rodger; BHill_slocity.org; Read, Chris; Blattler, James; ' '; rkoon_cayucosd.org; chrism_portsanluis.com; hagemann.associates_gmail.com; gm@groundsquirrelhollowcsd.org; scott@heritageranchcsd.com; rosborne@losososc.org; Mlglesias_ncsd.ca.gov; jstornetta_prcity.com; Fireprevention@sanmiguelcsd.org; kelly.dodds@sanmiguelcsd.org; cmurguia@graceenviro.com; nicole@oceanocsd.org; 'Carey Casciola'; jbrilz@templetoncsd.org; Chief_templetoncsd.org; Gira, Daniel; Robert Fitzroy; jpeters_gbpd.org; tamara.parent@sanmiguelcsd.org; dcrawford@cayucosd.org; Alan.Peters_fire.ca.gov; wsiemble_calpoly.edu
Cc: jeff.brislawn@woodplc.com; Kip J. Morais; Scott Milner; Karen Nall
Subject: HMPC Follow-up

Good afternoon, HMPC –

For those that missed this morning's meeting, please take some time to:

1. Review the goals handout (attached), revise and provide edits (San Luis Obispo is off the hook). **FIRM DUE DATE: MAY 3rd**
 - a. Are they still comprehensive?
 - b. Do they need to be modified, consolidated or adjusted to meet current priorities?
 - c. New jurisdictions – Can use the overall county goals, or develop their own.
2. Review the draft Hazard Priority Summary handout (attached). **FIRM DUE DATE: MAY 3rd**
 - a. Please consider if the probability, magnitude/severity and significance reflect your individual communities accurately.
 - b. This is important for each jurisdiction's planning committee to review and confirm.
 - c. Each jurisdiction will need mitigation actions for medium and high significance hazards identified in the HMP.
 - d. Please send changes to Jeff Brislawn - jeff.brislawn@woodplc.com

Please contact me with any questions. I am here to assist wherever I can. Thank you!

Best,

Jillian Ferguson | Planner, Long Range Division

(p) 805-781-1391 jferguson@co.slo.ca.us

[Website](#) | [Facebook](#) | [Twitter](#) | [Map](#)

<image001.png>

2160 Santa Barbara Avenue, San Luis Obispo, CA 93401-5240
T 805-781-7382

From: Jillian H. Ferguson <jferguson@co.slo.ca.us>
Sent: Monday, April 15, 2019 4:51 PM
To: Joe Guzzardi <jguzzardi@co.slo.ca.us>; Scott Milner <smilner@co.slo.ca.us>; Dave Flynn <dflynn@co.slo.ca.us>; Kate Ballantyne <kballantyne@co.slo.ca.us>; Bryan Iwamoto <biwamoto@co.slo.ca.us>; Francisco Pares <fpares@co.slo.ca.us>; Mladen Bandov <mbandov@co.slo.ca.us>; Lynda Auchinachie <lauchinachie@co.slo.ca.us>; dt5314@gmail.com; slieberman_fivecitiesfire.org <slieberman@fivecitiesfire.org>; Camilla Karamanlis <ckaramanlis@arroyogrande.org>; mdowning_arroyogrande.org <mdowning@arroyogrande.org>; Tom Peterson <tompeter@atascadero.org>; 'Casey Bryson' <cbryson@atascadero.org>; jpeters_gbp.org <jpeters@gbp.org>; Steve Knuckles <sknuckles@morrobayca.gov>; Matthew Vierra <mvierra@morrobayca.gov>; jstornetta_prcity.com <jstornetta@prcity.com>; mgruver@pismobeach.org; Aggson, Keith <kaggson@slocity.org>; Maggio, Rodger <rmaggio@slocity.org>; Hill, Robert <rhill@slocity.org>; Read, Chris <cread@slocity.org>; Blattler, James <jblattler@slocity.org>; ' ' <mychal@sslocsd.us>; rkoon_cayucosd.org <rkoon@cayucosd.org>; Brian O'Neill <Brian.O'Neill@coastal.ca.gov>; Chris Munson <chrism@portsanluis.com>; hagemann.associates_gmail.com <hagemann.associates@gmail.com>; gm@groundsquirrelhollowcsd.org; scott@heritageranchcsd.com; rosborne@losososcscsd.org; MIGlesias_ncsd.ca.gov <MIGlesias@ncsd.ca.gov>; Fireprevention@sanmiguelcsd.org; kelly.dodds@sanmiguelcsd.org; cmurguia@graceenviro.com; Nicole Miller <nicole@oceanocsd.org>; 'Carey Casciola' <carey@oceanocsd.org>; jbriltz_templetoncsd.org <jbriltz@templetoncsd.org>; Chief_templetoncsd.org <Chief@templetoncsd.org>
Cc: Karen Nall <knall@co.slo.ca.us>; Kip J. Morais <kmorais@co.slo.ca.us>; Jeffery Legato <jlegato@co.slo.ca.us>; Brislawn, Jeff P <jeff.brislawn@woodplc.com>; Gira, Daniel <daniel.gira@woodplc.com>; Robert Fitzroy <rfitzroy@co.slo.ca.us>
Subject: RE: HMPC Updates and Reminders

Good afternoon, HMPC members –

The Hazardous Materials Hazard Assessment has been posted onto the project Google Drive for review. In addition, the Assets section of the Hazard Identification and Risk Assessment has been included, which discusses the total inventory of buildings, populations, critical facilities, and natural, cultural and historic resources.

<https://drive.google.com/drive/folders/1E3oKhVTn69J5jIk4DLM3zqpoQXnPC7Qp?usp=sharing>

Please take some time to review the Hazardous Materials Hazard Assessment and please offer any comments or suggestions. Please also review the spreadsheets included within the google drive folder, which includes details on hazard risk for Critical Facilities and bridges. Thanks again to everyone for their hard work and collaboration.

Just another reminder that both the Goals Update Revisions and Mitigation Action Status worksheet are approaching their deadlines.

- Goals Update Revisions -

Due date: April 17

Note: Discuss the handout amongst your local planning teams to determine if you want to modify or change existing jurisdictional-specific goals, or potentially adopt the county-level goals (also being reviewed). Provide mark up of handout to Jeff or bring to late April meeting for discussion.

- Mitigation Action Tracker (Please find attached)

Due date: April 19

Wood had compiled all of the mitigation actions identified within the County and municipal hazard mitigation plans (and CSDs where applicable). A requirement of hazard mitigation planning updates is that each jurisdiction needs to report on the status of these existing mitigation actions, and adjust priorities if needed. This worksheet is meant to facilitate that.

1. Each jurisdiction has a separate tab in the spreadsheet. Use the '2019 Status' column picklist to identify one of the following for each action: In progress, Annual implementation, Deferred, Completed, or Deleted. 'Deferred' means the action will continue in the 2019 plan but has not yet been completed, but still worthwhile.
2. Use the '2019 Status Comments' column to note successes, reasons for deletion or deferral, progress etc.
3. Please also review the 'Priority' column and make adjustments, if needed. If the action is to continue in the 2019 plan, please make sure any yellow highlighted areas are filled in where certain details may be missing.

Please consider these guidelines when reviewing and updating your existing mitigation actions:

- Convene your local planning team to review the actions
- The number of actions should be focused so they are realistic and attainable in proportion to the jurisdiction's abilities to implement them; in some cases less is more.
- The actions should address hazards that are at least medium or high significance for the jurisdiction
- The focus should be on long-term, sustainable mitigation activities as opposed to preparedness or response oriented actions.
- Some jurisdictions may wish to focus their actions on those that would be eligible for FEMA Hazard Mitigation Assistance Grants.

Consider removing these actions (by indicating 'Deleted'):

- Actions that are not well defined
- Actions that are focused on continued compliance or maintenance related, with the exception of compliance with the NFIP.
- Actions where you might indicate 'Annual implementation.' These might be noted as an ongoing capability instead.
- Actions that are preparedness or response (note: you can leave in but FEMA will also require a true mitigation action for priority hazards)

Completed actions will be captured in a separate table in the updated plan to show progress towards implementation.

Please provide your edits to the spreadsheet to Jeff Brislawn jeff.brislawn@woodplc.com by **April 19th**. This will allow Jeff to do a quick summary in the HMPC meeting on April 25th, and it will prepare yourself to identify potential new mitigation actions, or improvements/adjustments to existing actions, in the meeting on April 30th. Some of you have already provided suggestions for new actions and these have been noted in the spreadsheet where applicable.

Kind regards,

Jillian Ferguson | Planner, Long Range Division

(p) 805-781-1391 jferguson@co.slo.ca.us

[Website](#) | [Facebook](#) | [Twitter](#) | [Map](#)



From: Jillian H. Ferguson

Sent: Thursday, March 28, 2019 12:10 PM

To: Joe Guzzardi <jguzzardi@co.slo.ca.us>; Scott Milner <smilner@co.slo.ca.us>; Dave Flynn <dflynn@co.slo.ca.us>; Kate Ballantyne <kballantyne@co.slo.ca.us>; Bryan Iwamoto <biwamoto@co.slo.ca.us>; Francisco Pares <fpares@co.slo.ca.us>; Mladen Bandov <mbandov@co.slo.ca.us>; Lynda Auchinachie <lauchinachie@co.slo.ca.us>; 'dt5314@gmail.com' <dt5314@gmail.com>; 'sliberman_fivecitiesfire.org' <sliberman@fivecitiesfire.org>; 'Camilla Karamanlis' <ckaramanlis@arroyogrande.org>; 'mdowning_arroyogrande.org' <mdowning@arroyogrande.org>; 'Tom Peterson' <tompeter@atascadero.org>; 'Casey Bryson' <cbryson@atascadero.org>; 'jpeters_gbp.org' <jpeters@gbp.org>; 'sknuckles_morrobayca.gov' <sknuckles@morrobayca.gov>; 'Matthew Vierra' <mvierra@morrobayca.gov>; 'jstornetta_prcity.com' <jstornetta@prcity.com>; 'mgruver@pismobeach.org' <mgruver@pismobeach.org>; 'Aggson, Keith' <kaggson@slocity.org>; 'Maggio, Rodger' <rmaggio@slocity.org>; 'BHill_slocity.org' <BHill@slocity.org>; 'Read, Chris' <cread@slocity.org>; 'Blattler, James' <jblattler@slocity.org>; 'mychal@sslocsd.us' <mychal@sslocsd.us>; 'rkoon_cayucosd.org' <rkoon@cayucosd.org>; Brian O'Neill <Brian.O'Neill@coastal.ca.gov>; 'chrism@portsanluis.com' <chrism@portsanluis.com>; 'hagemann.associates_gmail.com' <hagemann.associates@gmail.com>; 'gm@groundsquirrelhollowcsd.org' <gm@groundsquirrelhollowcsd.org>; 'scott@heritageranchcsd.com' <scott@heritageranchcsd.com>; 'rosborne@losososcsd.org' <rosborne@losososcsd.org>; 'Mario Iglesias' <MIglesias@ncsd.ca.gov>; 'Fireprevention@sanmiguelcsd.org' <Fireprevention@sanmiguelcsd.org>; 'kelly.dodds@sanmiguelcsd.org' <kelly.dodds@sanmiguelcsd.org>; 'cmurguia@graceenviro.com' <cmurguia@graceenviro.com>; 'Nicole Miller' <nicole@oceanocsd.org>; 'Carey Casciola' <carey@oceanocsd.org>; 'Jeff Briltz' <jbriltz@templetoncsd.org>; 'Chief' <Chief@templetoncsd.org>

Cc: Karen Nall <knall@co.slo.ca.us>; Kip J. Morais <kmorais@co.slo.ca.us>; Jeffery Legato <jlegato@co.slo.ca.us>; Brislawn, Jeff P' <jeff.brislawn@woodplc.com>; Gira, Daniel <daniel.gira@woodplc.com>; Robert Fitzroy <rfitzroy@co.slo.ca.us>

Subject: HMPC Updates and Reminders

Good afternoon –

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Due date: April 12 (we have 81 responses so far).

<https://www.surveymonkey.com/r/SLOHMPupdate>

- Jurisdictional Workbooks:

Due date: March 15

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Due date: April 5

Link:

<https://drive.google.com/drive/folders/1E3oKhVTn69J5jIk4DLM3zqpoQXnPC7Qp?usp=sharing>

- Goals Update Revisions -

Due date: April 17

Note: Discuss the handout amongst your local planning teams to determine if you want to modify or change existing jurisdictional-specific goals, or potentially adopt the county-level goals (also being reviewed). Provide mark up of handout to Jeff or bring to late April meeting for discussion.

- Mitigation Action Status –

Due date: TBD prior to late April meetings.

Note: Jurisdictions with existing LHMPs will need to provide a status on the mitigation actions or projects identified. A worksheet will be created to facilitate this. Looking for input on if the action has been completed, is ongoing, is deferred but still relevant, or should be deleted from the plan.

Overall Schedule –

Next HMPC meetings and second public workshop – April 23-25, specifics TBD

First Draft of updated HMP and Jurisdictional Annexes for HMPC Review: June 14

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Public comments due: August 9th

Final Plan for Cal OES Review: August 16th

Cal OES review comments – Mid Sept (estimated)

FEMA review – October-November (estimated)

Final Approved HMP for local adoption – December (estimated)

Thank you,

Jillian Ferguson | Planner, Long Range Division

(p) 805-781-1391 jferguson@co.slo.ca.us

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From: [Brislawn, Jeff P](#)
To: [Carr, Amy](#)
Subject: FW: HMPC Updates and Reminders
Date: Wednesday, May 15, 2019 2:00:51 PM
Attachments: [image002.png](#)
[image003.png](#)

Not sure If I sent this to you yet.

From: Blattler, James <jblattler@slocity.org>
Sent: Friday, May 03, 2019 8:11 PM
To: Brislawn, Jeff P <jeff.brislawn@woodplc.com>
Cc: Aggson, Keith <kaggson@slocity.org>; Jillian H. Ferguson <jferguson@co.slo.ca.us>; Maggio, Rodger <rmaggio@slocity.org>; Read, Chris <cread@slocity.org>; Hill, Robert <rhill@slocity.org>
Subject: Re: HMPC Updates and Reminders

Hi Jeff,

After consideration the City has decided to add a goal related to climate change to keep in-line with the County's goals. Here is our updated list of goals:

Goal 1: Cultivate a disaster-resistant **and resilient** community through implementation of risk reduction measures and increased public awareness to prepare for, respond to, and recover from natural and human-caused hazard events.

Goal 2: Reduce the severity of damage and losses due to natural and human-caused hazards.

Goal 3: Adopt and implement strategies to enable the City to prepare for and adapt to the impacts of climate change.

Thanks Jeff,

-James

James Blattler
Administrative Analyst
City of San Luis Obispo



Fire Department
2160 Santa Barbara Avenue, San Luis Obispo, CA 93401-5240
E jblattler@slocity.org
T 805.781.7382

From: Jillian H. Ferguson <jferguson@co.slo.ca.us>
Sent: Monday, April 15, 2019 4:51 PM
To: Joe Guzzardi <jguzzardi@co.slo.ca.us>; Scott Milner <smilner@co.slo.ca.us>; Dave Flynn <dflynn@co.slo.ca.us>; Kate Ballantyne <kballantyne@co.slo.ca.us>; Bryan Iwamoto <biwamoto@co.slo.ca.us>; Francisco Pares <fpares@co.slo.ca.us>; Mladen Bandov <mbandov@co.slo.ca.us>; Lynda Auchinachie <lauchinachie@co.slo.ca.us>; dt5314@gmail.com; slieberman_fivecitiesfire.org <slieberman@fivecitiesfire.org>; Camilla Karamanlis <ckaramanlis@arroyogrande.org>; mdowning_arroyogrande.org <mdowning@arroyogrande.org>; Tom Peterson <tompeter@atascadero.org>; 'Casey Bryson' <cbryson@atascadero.org>; jpeters_gbpd.org <jpeters@gbpd.org>; Steve Knuckles <sknuckles@morrobayca.gov>; Matthew Vierra <mvierra@morrobayca.gov>; jstornetta_prcity.com <jstornetta@prcity.com>; mgruver@pismobeach.org; Aggson, Keith <kaggson@slocity.org>; Maggio, Rodger <rmaggio@slocity.org>; Hill, Robert <rhill@slocity.org>; Read, Chris <cread@slocity.org>; Blattler, James <jblattler@slocity.org>; ',' <mychal@sslocsd.us>; rkoon_cayucosd.org <rkoon@cayucosd.org>; Brian O'Neill <Brian.O'Neill@coastal.ca.gov>; Chris Munson <chrism@portsanluis.com>; hagemann.associates_gmail.com <hagemann.associates@gmail.com>; gm@groundsquirrelhollowcsd.org; scott@heritageranchcsd.com; rosborne@losososcscsd.org; MIglesias_ncsd.ca.gov <MIglesias@ncsd.ca.gov>; Fireprevention@sanmiguelcsd.org; kelly.dodds@sanmiguelcsd.org; cmurguia@graceenviro.com; Nicole Miller <nicole@oceanocsd.org>; 'Carey Casciola' <carey@oceanocsd.org>; jbriltz_templetoncsd.org <jbriltz@templetoncsd.org>; Chief_templetoncsd.org <Chief@templetoncsd.org>
Cc: Karen Nall <knall@co.slo.ca.us>; Kip J. Morais <kmorais@co.slo.ca.us>; Jeffery Legato <jlegato@co.slo.ca.us>; Brislawn, Jeff P <jeff.brislawn@woodplc.com>; Gira, Daniel <daniel.gira@woodplc.com>; Robert Fitzroy <rfitzroy@co.slo.ca.us>
Subject: RE: HMPC Updates and Reminders

Good afternoon, HMPC members –

The Hazardous Materials Hazard Assessment has been posted onto the project Google Drive for review. In addition, the Assets section of the Hazard Identification and Risk Assessment has been included, which discusses the total inventory of buildings, populations, critical facilities, and natural, cultural and historic resources.

<https://drive.google.com/drive/folders/1E3oKhVTn69J5jIk4DLM3zqpoQXnPC7Qp?usp=sharing>

Please take some time to review the Hazardous Materials Hazard Assessment and please offer any comments or suggestions. Please also review the spreadsheets included within the google drive folder, which includes details on hazard risk for Critical Facilities and bridges. Thanks again to everyone for their hard work and collaboration.

Just another reminder that both the Goals Update Revisions and Mitigation Action Status worksheet are approaching their deadlines.

- Goals Update Revisions -

Due date: April 17

Note: Discuss the handout amongst your local planning teams to determine if you want to modify or change existing jurisdictional-specific goals, or potentially adopt the county-level goals (also being reviewed). Provide mark up of handout to Jeff or bring to late April meeting for discussion.

- Mitigation Action Tracker (Please find attached)

Due date: April 19

Wood had compiled all of the mitigation actions identified within the County and municipal hazard mitigation plans (and CSDs where applicable). A requirement of hazard mitigation planning updates is that each jurisdiction needs to report on the status of these existing mitigation actions, and adjust priorities if needed. This worksheet is meant to facilitate that.

1. Each jurisdiction has a separate tab in the spreadsheet. Use the '2019 Status' column picklist to identify one of the following for each action: In progress, Annual implementation, Deferred, Completed, or Deleted. 'Deferred' means the action will continue in the 2019 plan but has not yet been completed, but still worthwhile.
2. Use the '2019 Status Comments' column to note successes, reasons for deletion or deferral, progress etc.
3. Please also review the 'Priority' column and make adjustments, if needed. If the action is to continue in the 2019 plan, please make sure any yellow highlighted areas are filled in where certain details may be missing.

Please consider these guidelines when reviewing and updating your existing mitigation actions:

- Convene your local planning team to review the actions

- The number of actions should be focused so they are realistic and attainable in proportion to the jurisdiction's abilities to implement them; in some cases less is more.
- The actions should address hazards that are at least medium or high significance for the jurisdiction
- The focus should be on long-term, sustainable mitigation activities as opposed to preparedness or response oriented actions.
- Some jurisdictions may wish to focus their actions on those that would be eligible for FEMA Hazard Mitigation Assistance Grants.

Consider removing these actions (by indicating 'Deleted'):

- Actions that are not well defined
- Actions that are focused on continued compliance or maintenance related, with the exception of compliance with the NFIP.
- Actions where you might indicate 'Annual implementation.' These might be noted as an ongoing capability instead.
- Actions that are preparedness or response (note: you can leave in but FEMA will also require a true mitigation action for priority hazards)

Completed actions will be captured in a separate table in the updated plan to show progress towards implementation.

Please provide your edits to the spreadsheet to Jeff Brislawn jeff.brislawn@woodplc.com by **April 19th**. This will allow Jeff to do a quick summary in the HMPC meeting on April 25th, and it will prepare yourself to identify potential new mitigation actions, or improvements/adjustments to existing actions, in the meeting on April 30th. Some of you have already provided suggestions for new actions and these have been noted in the spreadsheet where applicable.

Kind regards,

Jillian Ferguson | Planner, Long Range Division

(p) 805-781-1391 jferguson@co.slo.ca.us

[Website](#) | [Facebook](#) | [Twitter](#) | [Map](#)



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SLO Multi-jurisdictional Hazard Mitigation Plan Goals Update Worksheet – 4-24-19

San Luis Obispo County Local Hazard Mitigation Plan – 2019 Goals and Objectives

(Red text is new or changed)

Goal 1 – Promote understanding and support for hazard mitigation by key stakeholders and the public within the County of San Luis Obispo.

- Objective 1.1 – Educate key stakeholders and the public to increase awareness of hazards and opportunities for mitigating hazards

Goal 2 – Mitigate hazard impacts to existing and future development.

~~Ensure that future development is protected from natural disasters.~~

- Objective 2.1 – Limit new development in hazard areas, and as permissible, build to standards that will prevent or reduce damage.

Goal 3 – Build and support local capacity and commitment to minimize the County of San Luis Obispo’s vulnerability to potential hazards through collaboration with the incorporated cities and special districts.

- Objective 3.1 - Improve existing capabilities to manage emergency situations
- Objective 3.2 - Enhance the safety of residents, students and staff within the community
- Objective 3.3 - Assure that at-risk populations and those with access and functional needs (AFN) are addressed in all plans and procedures
- Objective 3.4 – Identify and collaborate on hazard mitigation projects that benefit multiple jurisdictions.

Goal 4 - Minimize the level of damage and losses to people, existing and future critical facilities, property and infrastructure due to flooding natural hazards.

- Objective 4.1 - Enhance the ability of community assets, particularly critical facilities, located in the 100-year floodplain flood zones to handle existing average and projected flood waters.
- Objective 4.2 – Develop a comprehensive approach to reducing the level of damage and losses due to wildland fires through resilient community and critical infrastructure design, vegetation management, weed abatement, ignition resistant construction, code enforcement, GIS mapping, and planning processes.
- Objective 4.3 – In order to better protect life and property, develop more accurate, comprehensive series of countywide GIS geology maps and data sets
- Objective 4.4 - Develop a comprehensive approach to reducing the level of damage and losses due to natural hazards through improved policies, procedures, training, and evacuation planning

Goal 5 - Minimize human morbidity and mortality as a result of biological agent threats.

- Objective 5.1 - Curtail the entry and spread of infectious diseases within San Luis Obispo County

Goal 6 - Minimize the extent of damage and destruction to crops, farm animals, humans, and existing and future facilities as a result of agricultural pests and disease.

- Objective 6.1 - Curtail the entry of harmful agricultural pests into San Luis Obispo County
- Objective 6.2 - Quickly detect and eradicate pathogenic pests within the County. When eradication is not feasible, minimize spread

Goal 7 - Adopt **and** implement strategies to enable the County to prepare for and adapt to the impacts of climate change through collaboration with the incorporated cities **and special districts**.

- Objective 7.1 - Minimize the harmful effects of climate change by identifying, assessing and preparing for impacts. Coordinate with the incorporated cities and special districts to implement strategies with regional significance.

Deleted Goals

Goal 5 - Minimize the level of damage and losses to people, existing and future critical facilities and infrastructure due to wildland fires.

Goal 6 - Minimize the level of damage and losses to people, existing and future critical facilities and infrastructure due to geological events (earthquakes, landslides, and liquefaction)

Goal 7 - Minimize the level of damage and losses to people, existing and future critical facilities and infrastructure due to tsunami events

City of San Luis Obispo 2019 Goals

Goal 1 - Cultivate a disaster-resistant **and resilient** community through implementation of risk reduction measures and increased public awareness to prepare for, respond to, and recover from natural and human-caused hazard events.

Goal 2 - Reduce the severity of damage and losses due to natural and human-caused hazards.

City of Atascadero Local Hazard Mitigation Plan - 2014

Goal 1 – Increase public awareness of current drought conditions

Goal 2 – Minimize the loss of property and life as the result of a windstorm

Goal 3 – Reduce the possibility of damage and losses due to dam failure

Goal 4 – Reduce the possibility of damage and losses due to earthquake

Goal 5 – Minimize property damage as a result of expansive unstable soil conditions

Goal 6 – Reduce the possibility of damage and losses due to floods

Goal 7 – Reduce the possibility of damage and losses due to land subsidence

Goal 8 – Reduce the possibility of damage and losses due to wildland fires

City of Paso Robles Local Hazard Mitigation Plan – 2016

Goal 1 – Minimize loss of life, injury and damage to property, the economy, and the environment from the hazards identified in the 2016 LHMP

Goal 2 – Build and enhance local mitigation capabilities to reduce the hazards identified in the 2016 LHMP. This will help ensure individual safety, reduce damage to public buildings and guarantee continuity of emergency services

City of Morro Bay Local Hazard Mitigation Plan - 2006

Goal 1 – Promote disaster-resistant future development

Goal 2 – Promote understanding and support for hazard mitigation by key stakeholders and the public within the City of Morro Bay

Goal 3 – Build and support local capacity and commitment to minimize the City of Morro Bay's vulnerability to potential hazards

Goal 4 – Minimize the level of damage and losses to people, existing and future critical facilities and infrastructure due to flooding

Goal 5 – Minimize the level of damage and losses to people, existing and future critical facilities and infrastructure due to tsunamis

Goal 6 – Minimize the level of damage and losses to people, existing and future critical facilities and infrastructure due to wildland fires

Goal 7 – Minimize the level of damage and losses to people, existing and future critical facilities and infrastructure due to earthquakes

Goal 8 – Minimize the level of damage and losses to people, existing and future critical facilities and infrastructure due to accidental spills and releases of hazardous materials

Goal 9 – Minimize the level of damage and losses to people, existing and future critical facilities and infrastructure due to biological agent threats

City of Pismo Beach Local Hazard Mitigation Plan – 2014

Goal 1 – Promote disaster-resistant development

Goal 2 – Build and support local capacity to enable the public to prepare for, respond to and recover from disasters

Goal 3 – Reduce the possibility of damage and losses due to bluff/erosion failure

Goal 4 – Reduce the possibility of damage and losses due to coastal storm

Goal 5 – Reduce the possibility of damage and losses due to dam failure

Goal 6 – Reduce the possibility of damage and losses due to earthquake

Goal 7 – Reduce the possibility of damage and losses due to flood

Goal 8 – Reduce the possibility of damage and losses due to hazardous material events

Goal 9 – Reduce the possibility of damage and losses due to landslide

Goal 10 – Reduce the possibility of damage and losses due to tsunami

Goal 11 – Reduce the possibility of damage and losses due to wildland fire

Arroyo Grande/Grover Beach Multi-Jurisdictional Local Hazard Mitigation Plan – 2014

City of Arroyo Grande

Goal 1 - Minimize the level of damage and losses due to flooding

Goal 2 - Minimize the level of damage and losses due to earthquakes

Goal 3 - Minimize the level of damage and losses due to wildland and structure fires

Goal 4 - Minimize impacts to the community from dam inundation events

City of Grover Beach

Goal 1 – Minimize the level of damage and losses due to earthquakes

Goal 2 – Minimize the level of damage and losses due to flooding

Goal 3 – Minimize the level of damage and losses due to Wildland and Structure Fires

Goal 4 – Minimize the level of damage and losses due to Tsunami inundation

South San Luis Obispo County Sanitation District

Goal 1 – Minimize earthquake damage and losses due to earthquakes

Goal 2 – Minimize flooding damage and losses due to flooding

Goal 3 – Minimize the level of losses and damage due to fires

Goal 4 – Minimize tsunami impacts to South San Luis Obispo County Sanitation District facilities

Lucia Mar Unified School District

Goal 1 – Minimize earthquake damage and losses to School District facilities due to earthquake

Goal 2 – Minimize damage due to flooding

Goal 3 – Minimize damage due to fires

Goal 4 – Minimize potential tsunami impacts to Lucia Mar Unified School District facilities

California State Hazard Mitigation Plan – 2018

Goal 1 – Significantly reduce life and loss

Goal 2 – Minimize damage to structures and property, and minimize interruption of essential services and activities

Goal 3 – Protect the environment

Goal 4 – Promote community resilience through integration of hazard mitigation with public policy and standard business practices

From: [Brislawn, Jeff P](#)
To: [Carr, Amy](#)
Subject: FW: Input from County Public Health on Hazard Mitigation Plan
Date: Wednesday, May 08, 2019 9:52:08 AM

From: Scott Milner <smilner@co.slo.ca.us>
Sent: Tuesday, May 07, 2019 4:32 PM
To: Jillian H. Ferguson <jferguson@co.slo.ca.us>; Brislawn, Jeff P <jeff.brislawn@woodplc.com>
Subject: Input from County Public Health on Hazard Mitigation Plan

Below are the edits/revisions requested by County Public Health regarding the Public Health Goal/Objective/Mitigation Actions.

They also made some comments/edits on the Google Drive documents for the Public Health related sections.

I provided them the worksheet for the new mitigation actions, so they may have additional by May 20th.

From: Elizabeth Merson
Sent: Tuesday, May 7, 2019 2:37 PM
To: Scott Milner
Cc: Penny E. Borenstein; Frederick S Rosen; Christine Gaiger; Ann McDowell; Leslie Terry
Subject: RE: Link to Hazard Mitigation Plan Shared Google Drive

Hi Scott,

Thanks for meeting with us today to discuss the Mitigation. Here are the edits we discussed at the meeting today:

Goal 5	Minimize human morbidity and mortality as a result of biological hazards
Objective 5.1	Limit the entry and spread of infectious diseases within San Luis Obispo County.
Mitigation Action 5.A Status: Ongoing	Continue communication and coordination efforts amongst Public Health, local hospitals, healthcare workers and first responders to provide information about the effects and transmission of diseases causing epidemics along with specific preventative measures.
Mitigation Action 5.B Status: Ongoing	Continue general public and patient education regarding basic hygiene, cough etiquette and other disease prevention methods.
Mitigation Action 5.C Status: Ongoing	Increase involvement of special populations (e.g. disabled, elderly, homeless) in education and disaster preparedness activities.
Mitigation Action 5.D Status: Deferred	Support establishment of a Vector Control Program in San Luis Obispo County.
Mitigation Action 5.E	Sustain laboratory capacity utilizing continuously advancing technological standards; increase capacity for testing of

Status: Ongoing

additional high risk pathogens.



Elizabeth Merson
Program Manager
County of San Luis Obispo Health Agency
Public Health Emergency Preparedness
2180 Johnson Ave, 2nd Floor, San Luis Obispo, CA 93401
O: (805) 781-1077 M: (805) 440-2229 F: (805) 788-2715

From: Peters, Alan@CALFIRE <Alan.Peters@fire.ca.gov>
Sent: Thursday, April 25, 2019 1:33 PM
To: Jillian H. Ferguson; Brislawn, Jeff P
Cc: Scott Milner; Fowler, David@CALFIRE; Craig, Travis@CALFIRE
Subject: RE: [EXT]Re: Mitigation Goals and Actions from 2014 LHMP
Attachments: Implementation Strategy from 2014 LHMP_CAL FIRE comments.docx

Jillian,

Nice meeting you today. At today's meeting, there was mention of a shared Google Drive link which I am not aware of. There was also mention of a tracker, which I am not aware of. Dan Turner had told me there was an email string about this but there were no CAL FIRE recipients. I apologize if we misplaced this information. The only document I have contributed to is the attached Word document which you requested back in February. I had assumed that this information made it to Wood?

For all of CAL FIRE's ongoing and proposed mitigation activities (wildfire, earthquake, tsunami), we will encourage the LHMP to reference the Unit Fire Plan http://cdfdata.fire.ca.gov/fire_er/fpp_planning_plans_details?plan_id=318. CAL FIRE jurisdiction includes State Responsibility Area (SRA), and Local Responsibility Area (LRA), where County Fire is responsible, such as Avila Valley CSD, Los Osos CSD, the City of Pismo Beach, and other unincorporated areas, such as Nipomo, with no other local fire protection agency. The brand new CWPP has been signed by the County Fire Chiefs, so this now serves as the master county-wide wildfire mitigation plan. Due to the sheer number of ongoing and proposed mitigation activities, hyperlinking these other plans as appendices to the LHMP is really the only practical means of listing everything.

For CAL FIRE, I'll try to be the point-of-contact, but would recommend including myself, Travis Craig and Dave Fowler in email strings since it is sometimes difficult for us to stay on top of time-sensitive tasks once fire season gets busy.

Thanks,

Alan Peters

SLU Unit Forester
(805) 903-3406

From: Jillian H. Ferguson [mailto:jferguson@co.slo.ca.us]
Sent: Wednesday, April 24, 2019 1:35 PM
To: Peters, Alan@CALFIRE <Alan.Peters@fire.ca.gov>
Subject: RE: [EXT]Re: Mitigation Goals and Actions from 2014 LHMP

Hello, Alan –

I left you a voicemail last week regarding County Cal Fire participation for the LHMP update. We have two remaining meetings, and it has been brought to my attention that I do not have a County Cal Fire representative that I have been extending invites too. I apologize for the oversight. The last two meetings are scheduled for the mornings of April 25th and 30th. I sent you outlook invites, and perhaps you or someone else from your office can attend.

Thanks again,

Jillian Ferguson | Planner, Long Range Division

(p) 805-781-1391 jferguson@co.slo.ca.us

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COUNTY OF SAN LUIS OBISPO
Planning & Building

From: Jillian H. Ferguson

Sent: Wednesday, February 27, 2019 3:48 PM

To: 'Peters, Alan@CALFIRE' <Alan.Peters@fire.ca.gov>

Cc: Scott Milner <smilner@co.slo.ca.us>; Dave Fowler <david.fowler@fire.ca.gov>

Subject: RE: [EXT]Re: Mitigation Goals and Actions from 2014 LHMP

Thank you, Alan. We appreciate your help.

Jillian Ferguson | Planner, Long Range Division

(p) 805-781-1391 jferguson@co.slo.ca.us

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COUNTY OF SAN LUIS OBISPO
Planning & Building

From: Peters, Alan@CALFIRE <Alan.Peters@fire.ca.gov>

Sent: Wednesday, February 27, 2019 3:30 PM

To: Jillian H. Ferguson <jferguson@co.slo.ca.us>

Cc: Scott Milner <smilner@co.slo.ca.us>; Dave Fowler <david.fowler@fire.ca.gov>

Subject: RE: [EXT]Re: Mitigation Goals and Actions from 2014 LHMP

Jillian,

Thanks for the helpful examples. Please see my comments in **red** and let me know if you need anything additional. Thanks,

J. Alan Peters, Unit Forester

CAL FIRE, San Luis Obispo Unit

San Luis Obispo, CA 93405

(805) 593-3406 Desk

(805) 903-3406 Cell

<http://www.calfireslo.org/prevention.html>

https://twitter.com/CALFIRE_SLO



From: Jillian H. Ferguson [<mailto:jferguson@co.slo.ca.us>]

Sent: Wednesday, February 27, 2019 11:20 AM

To: Peters, Alan@CALFIRE <Alan.Peters@fire.ca.gov>

Cc: Scott Milner <smilner@co.slo.ca.us>

Subject: RE: [EXT]Re: Mitigation Goals and Actions from 2014 LHMP

Thank you for your email, Alan.

I left you a voicemail. Essentially, the consultant wants to track our progress since the 2014 LHMP update. If you could briefly comment on the progress and steps made since the update, that would be ideal. Attached are examples from both OES and Public Works. I appreciate your help. Please feel free to contact me with any questions.

Thank you,

Jillian Ferguson | Planner, Long Range Division

(p) 805-781-1391 jferguson@co.slo.ca.us

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COUNTY OF SAN LUIS OBISPO
Planning & Building

From: Peters, Alan@CALFIRE <Alan.Peters@fire.ca.gov>

Sent: Wednesday, February 27, 2019 10:57 AM

To: Jillian H. Ferguson <jferguson@co.slo.ca.us>; Dave Fowler <david.fowler@fire.ca.gov>

Cc: Scott Milner <smilner@co.slo.ca.us>

Subject: [EXT]Re: Mitigation Goals and Actions from 2014 LHMP

ATTENTION: This email originated from outside the County's network. Use caution when opening attachments or links.

Jillian,

It was not clear what was requested so I apologize; I simply updated the status columns, since everything is now "ongoing". I did not see a request for comments or a narrative. Please resend the document and explain exactly what you are looking for and where in the document this information is needed. Thanks,

Alan Peters

SLU Unit Forester

(805) 903-3406

----- Original message -----

From: "Jillian H. Ferguson" <jferguson@co.slo.ca.us>

Date: 2/27/19 10:02 (GMT-08:00)

To: "Fowler, David@CALFIRE" <David.Fowler@fire.ca.gov>, "Peters, Alan@CALFIRE" <Alan.Peters@fire.ca.gov>

Cc: Scott Milner <smilner@co.slo.ca.us>

Subject: RE: Mitigation Goals and Actions from 2014 LHMP

Good morning, Dave & Alan –

I'm following up on the progress regarding the 2014 Implementation Strategy progress notes. Can you please

submit your comments by the end of this week. Please feel free to contact me with any questions.

Thank you,

Jillian Ferguson | Planner, Long Range Division

(p) 805-781-1391 jferguson@co.slo.ca.us

[Website](#) | [Facebook](#) | [Twitter](#) | [Map](#)



COUNTY OF SAN LUIS OBISPO
Planning & Building

From: Scott Milner <smilner@co.slo.ca.us>

Sent: Wednesday, February 13, 2019 8:52 AM

To: Alan.Peters_fire.ca.gov <Alan.Peters@fire.ca.gov>; Dave Fowler <david.fowler@fire.ca.gov>

Cc: Jillian H. Ferguson <jferguson@co.slo.ca.us>

Subject: Mitigation Goals and Actions from 2014 LHMP

We were looking for updates from County Fire on the progress towards completing the mitigation actions from the 2014 LHMP. If County Fire can provide the progress notes narrative for the fire related items by February 22nd to Jillian Ferguson with County Planning (see email below) then we can report on our progress in the 2019 LHMP update.

Thanks,

Scott Milner

Emergency Services Coordinator

1055 Monterey St., D430

San Luis Obispo, CA 93408

(p) 805-781-4128

(f) 805-781-5005

smilner@co.slo.ca.us

COUNTY OF SAN LUIS OBISPO

OFFICE OF EMERGENCY SERVICES

www.slocounty.ca.gov/OES



From: Jillian H. Ferguson [<mailto:jferguson@co.slo.ca.us>]
Sent: Monday, February 11, 2019 12:17 PM
To: Craig, Travis@CALFIRE <Travis.Craig@fire.ca.gov>; Kate Ballantyne <kballantyne@co.slo.ca.us>; Elizabeth Merson <emerson@co.slo.ca.us>
Cc: Jay Johnson <jgjohnson@co.slo.ca.us>; Karen Nall <knall@co.slo.ca.us>; Scott Milner <smilner@co.slo.ca.us>
Subject: Mitigation Goals and Actions from 2014 LHMP

Good afternoon,

Planning is overseeing the Multi-Jurisdictional Local Hazard Mitigation Plan update currently in progress. Regarding the last update for this plan, completed in 2014, we would like to collect the progress made by the county since this time. May we request that Public Works, OES, County Fire and Public Health update portions of the attached Implementation Strategy from 2014 and submit the progress notes to myself, Jillian Ferguson.

Please feel free to call or email me with any questions. Thank you in advance.

Best,

Jillian Ferguson | Planner, Long Range Division

(p) 805-781-1391 jferguson@co.slo.ca.us

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COUNTY OF SAN LUIS OBISPO
Planning & Building

Carr, Amy

From: Brislawn, Jeff P
Sent: Monday, April 29, 2019 11:21 PM
To: Carr, Amy
Subject: FW: HMPC Follow-up

From: Michael Gruver <mgruver@PismoBeach.org>
Sent: Monday, April 29, 2019 6:11 PM
To: Jillian H. Ferguson <jferguson@co.slo.ca.us>; Brislawn, Jeff P <jeff.brislawn@woodplc.com>
Subject: RE: HMPC Follow-up

I have reviewed the goals handout. Goals listed for Pismo still relevant.

Also reviewed the Priorities. Flood significance is still low due to a small portion of the City in FEMA floodzones. Earthquake significance still likely moderate due to location to known active faults and local geology formations.

Mike Gruver
Associate Planner
City of Pismo Beach
760 Mattie Road
Pismo Beach, CA 93449
Phone: 805-773-7090
Fax: 805-773-4684
Email: mgruver@pismo-beach.org



From: Jillian H. Ferguson [<mailto:jferguson@co.slo.ca.us>]
Sent: Thursday, April 25, 2019 3:28 PM
To: Jeffery Legato <jlegato@co.slo.ca.us>; Brislawn, Jeff P <jeff.brislawn@woodplc.com>; Kip J. Morais <kmorais@co.slo.ca.us>; Joe Guzzardi <jguzzardi@co.slo.ca.us>; Scott Milner <smilner@co.slo.ca.us>; Dave Flynn <dflynn@co.slo.ca.us>; Kate Ballantyne <kballantyne@co.slo.ca.us>; Bryan Iwamoto <biwamoto@co.slo.ca.us>; Francisco Pares <fpares@co.slo.ca.us>; Mladen Bandov <mbandov@co.slo.ca.us>; Lynda Auchinachie <lauchinachie@co.slo.ca.us>; dt5314@gmail.com; slieberman_fivecitiesfire.org <slieberman@fivecitiesfire.org>; Camilla Karamanlis <ckaramanlis@arroyogrande.org>; mdowning_arroyogrande.org <mdowning@arroyogrande.org>; Tom Peterson <tompetereson@atascadero.org>; 'Casey Bryson' <cbryson@atascadero.org>; jpeters@gdpd.org; sknuckles_morrobayca.gov <sknuckles@morrobayca.gov>; 'Matthew Vierra' <mvierra@morrobayca.gov>; jstornetta@prcity.com; Michael Gruver <mgruver@PismoBeach.org>; Aggson, Keith <kaggson@slocity.org>; Maggio, Rodger <rmaggio@slocity.org>; BHill_slocity.org <BHill@slocity.org>; Read, Chris <cread@slocity.org>; Blattler, James <jblattler@slocity.org>; ' ' <mychal@sslocsd.us>; rkoon_cayucosd.org <rkoon@cayucosd.org>; chrism_portsanluis.com <chrism@portsanluis.com>; hagemann.associates_gmail.com <hagemann.associates@gmail.com>; gm@groundsquirlhollowcsd.org; scott@heritageranchcsd.com;

rosborne@lososocsd.org; Mlglesias_ncsd.ca.gov <Mlglesias@ncsd.ca.gov>; jstornetta_prcity.com <jstornetta@prcity.com>; Fireprevention@sanmiguelcsd.org; kelly.dodds@sanmiguelcsd.org; cmurguia@graceenviro.com; nicole@oceanocsd.org; 'Carey Casciola' <carey@oceanocsd.org>; jbrilz@templetoncsd.org; Chief_templetoncsd.org <Chief@templetoncsd.org>; Gira, Daniel <daniel.gira@woodplc.com>; Robert Fitzroy <rfitzroy@co.slo.ca.us>; John E. Peters Jr. <jpeters@gbpd.org>; tamara.parent@sanmiguelcsd.org; dcrawford@cayucossd.org; Alan.Peters_fire.ca.gov <Alan.Peters@fire.ca.gov>; wsiembie_calpoly.edu <wsiembie@calpoly.edu>

Cc: jeff.brislawn@woodplc.com; Kip J. Morais <kmorais@co.slo.ca.us>; Scott Milner <smilner@co.slo.ca.us>; Karen Nall <knall@co.slo.ca.us>

Subject: HMPC Follow-up

Good afternoon, HMPC –

For those that missed this morning's meeting, please take some time to:

1. Review the goals handout (attached), revise and provide edits (San Luis Obispo is off the hook). **FIRM DUE DATE: MAY 3rd**
 - a. Are they still comprehensive?
 - b. Do they need to be modified, consolidated or adjusted to meet current priorities?
 - c. New jurisdictions – Can use the overall county goals, or develop their own.
2. Review the draft Hazard Priority Summary handout (attached). **FIRM DUE DATE: MAY 3rd**
 - a. Please consider if the probability, magnitude/severity and significance reflect your individual communities accurately.
 - b. This is important for each jurisdiction's planning committee to review and confirm.
 - c. Each jurisdiction will need mitigation actions for medium and high significance hazards identified in the HMP.
 - d. Please send changes to Jeff Brislawn - jeff.brislawn@woodplc.com

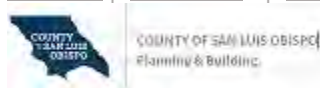
Please contact me with any questions. I am here to assist wherever I can. Thank you!

Best,

Jillian Ferguson | Planner, Long Range Division

(p) 805-781-1391 jferguson@co.slo.ca.us

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From: [Brislawn, Jeff P](#)
To: [Carr, Amy](#)
Subject: FW: HMPC Follow-up
Date: Monday, May 06, 2019 10:13:05 PM
Attachments: [image002.png](#)
[image004.png](#)

From: Jillian H. Ferguson <jferguson@co.slo.ca.us>
Sent: Monday, May 06, 2019 9:28 AM
To: Brislawn, Jeff P <jeff.brislawn@woodplc.com>
Subject: FW: HMPC Follow-up

Happy Monday, Jeff –

Below are the only comments I've received regarding the goals/objectives. Please let me know if your team would like further clarification.

Thanks,
Jill

From: Mladen Bandov <mbandov@co.slo.ca.us>
Sent: Friday, May 03, 2019 3:50 PM
To: Jillian H. Ferguson <jferguson@co.slo.ca.us>
Cc: Dave Flynn <dflynn@co.slo.ca.us>; Kate Ballantyne <kballantyne@co.slo.ca.us>
Subject: RE: HMPC Follow-up

Hi Jillian,

The new goals for the County look good.

Our team discussed changing the work “handle” in Objective 4.1. Instead, this should be “defend against” or something that is more about protection. Also, I’m not clear what “average” and “projected” flood waters means. Could this objective be something like “Enhance the ability of community assets, particularly critical facilities, located in **flood zones** to defend against flood waters.

- Objective 4.1 - Enhance the ability of community assets, particularly critical facilities, located in ~~the 100-year floodplain~~ **flood zones** to handle existing **average** and projected flood waters.



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Planning & Building

The San Luis Obispo Permit Center (downtown) hours are Monday-Friday from 8:30 am - 3:00 pm

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Trevor Keith

Director

Department of Planning
and Building Hires New
Division Manager

Planning and Building
Promotes Housing



Photo of cars during a flood

Hazard Mitigation Plan Draft Available for Review and Input

an Upcoming Public Meeting

Hazard Mitigation Plan Draft Available for Review and Input

Be a Part of the Process: Help us Prepare for an Emergency

County to Continue Cannabis Regulations Discussion on October 17, 2017

County Supervisors Name New Planning and Building Director in 5-0 Vote

Help Determine and Address the Housing Needs in San Luis Obispo County

Planning and Building Launches New Online Services

County Takes One Step Closer to Permanent Legislation on Cannabis

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**Interactive Maps
(Land Use View)**

Author: Department of Planning and Building

Date: 10/17/2019 11:24:44 AM

Share this



We have witnessed natural disasters throughout California and even in neighboring counties. In San Luis Obispo County, the Local Hazard Mitigation Plan (LHMP) is our guide for handling local disasters. A draft of the updated Hazard Mitigation Plan is being made available for public review and comment.

For the first time, the LHMP includes all local jurisdictions throughout San Luis Obispo County, so all residents who live within San Luis Obispo County are affected. The plan assesses risks posed by natural and human-caused hazards, identifies ways to reduce those risks, and allows the County and participating jurisdictions to remain eligible for mitigation grant funding from FEMA.

The County is now soliciting public comment on the plan before it is finalized and submitted for FEMA review and approval.

How Can You Help?

The public is invited to review the draft plan here.

The public is invited to provide comments on the plan through this link until November 13, 2019.

For more information, please contact:

Jillian Ferguson



#1

INCOMPLETE

Collector:	Web Link 1 (Web Link)
Started:	Wednesday, October 02, 2019 3:37:28 PM
Last Modified:	Wednesday, October 02, 2019 3:38:42 PM
Time Spent:	00:01:13
IP Address:	204.88.224.12

Page 2: Affiliation

Q1 Select affiliation (select one):	Government - Local
--	---------------------------

Page 3: Comments

Q2 Please provide comments regarding the Draft Multi-jurisdictional Hazard Mitigation Plan here:	Respondent skipped this question
---	---

#2

INCOMPLETE

Collector:	Web Link 1 (Web Link)
Started:	Thursday, October 10, 2019 1:55:33 PM
Last Modified:	Thursday, October 10, 2019 1:56:08 PM
Time Spent:	00:00:35
IP Address:	71.92.230.250

Page 2: Affiliation

Q1 Select affiliation (select one):

Government - State

Page 3: Comments

Q2 Please provide comments regarding the Draft Multi-jurisdictional Hazard Mitigation Plan here:

Respondent skipped this question

#3

COMPLETE

Collector:	Web Link 1 (Web Link)
Started:	Tuesday, October 29, 2019 9:43:24 PM
Last Modified:	Tuesday, October 29, 2019 9:50:30 PM
Time Spent:	00:07:05
IP Address:	108.90.201.139

Page 2: Affiliation

Q1 Select affiliation (select one):

Member of the public

Page 3: Comments

Q2 Please provide comments regarding the Draft Multi-jurisdictional Hazard Mitigation Plan here:

Where are the evacuation routes and resources? The ReadSLO website doesn't provide any information for potential fire evacuations or emergency routes.

I see the Dam Failure Evacuation plan is referenced a lot but what are residents suppose to do without internet access in the event of an emergency? Even if the specific fire location is unknown there is a lot that can be done to predict fire patterns and generalize routes.

#4

COMPLETE

Collector: Web Link 1 (Web Link)
Started: Sunday, November 03, 2019 8:31:38 PM
Last Modified: Sunday, November 03, 2019 8:43:45 PM
Time Spent: 00:12:06
IP Address: 24.180.9.28

Page 2: Affiliation

Q1 Select affiliation (select one):
Other (please specify):
Retired (Dec 2018) County OES Emergency Services Mgr

Page 3: Comments

Q2 Please provide comments regarding the Draft Multi-jurisdictional Hazard Mitigation Plan here:

County of San Luis Obispo Draft LHMP Comments (Base Plan only)
Comments from Ron Alsop, November 3, 2019 (These comments were also provided via e-mail directly to Jillian Ferguson and Scott Milner in Word format).

Note: I was a lead for working on and working with contractors/consultants on all previous SLO County LHMPs in my role as then County OES Emergency Services Manager or Emergency Services Coordinator. In fact, the error related to San Simeon Earthquake wording – you will come across it below – looks like it might have been my mistake!

Thank you for the opportunity to provide input on the draft LHMP. It looks great! It is obvious a lot of good, hard work went into it.

But as with any complicated, detailed document with hundreds of pages, it is easy to miss a few things. I have some general comments I will list after the first two things I think are very important to add in and/or correct.

The first relates to no mention at all of the recent three-year (2014-2017) drought emergency, including a three-year long Proclamation of Local Emergency (commonly referred to as declaration of emergency) by the County of San Luis Obispo, which was severe and involved many thousands of hours over the course of the three years

The second important item as I see it is correcting the wording related to San Simeon earthquake comments.

After these two subject area comments, I have put general comments as they appear in order (for the most part) in the draft LHMP, and reference the page numbers for each.

The 2014-2017 drought: There is no information about the local drought Proclamation of Emergency we had for three years, it is not in Table 5.3 at all – not even a mention of the drought for 2014-2017 (I see droughts from earlier years are shown) – nor is it referenced in the Risk Assessment drought section of the LHMP; there IS a mention of the Governor's proclamation/declaration on page 5-152 as part of the SGMA info.

It looks like page 5-155 could have our drought proclamation/declaration info added, as a natural flow on that page. As well as adding it to the historical chart in Table 5.3. Below is suggested wording, but hey I am just a humble citizen resident! :)

"In addition to the Governor's Proclamation, a County of San Luis Obispo local Proclamation of Emergency was in effect from March 11, 2014 to May 2, 2017 due to drought conditions and the related wide-ranging impacts. The Governor's proclaimed State of Emergency due to the drought covered a similar period, from January 17, 2014 to April 7, 2017."

Moving on the second of most importance to me is the wording on 5-187 about the San Simeon Earthquake; it currently reads in the draft LHMP as:

"The nearest affected city was Paso Robles, and as an interest side note, the issue of retrofitting unreinforced masonry buildings became apparently. Statistics indicate that, of 53 unreinforced masonry buildings in the city, none of the 9 retrofitted buildings experienced major damages."

That might just be wording left in from the last version, and was missed last time. None-the-less, perhaps a replacement to that paragraph might read:

"The nearest affected city was Paso Robles. Perhaps not surprisingly, the issue of retrofitting unreinforced masonry buildings began to receive more attention as a result of this damaging earthquake. It was also reported that of 53 unreinforced masonry buildings in the city, none of the 9 retrofitted buildings experienced major damages."

Moving on to more minor review comments and input:

Page 3-12: Suggest changing "Paso School District" to "Paso Robles Joint Unified School District"

Page 3-16: Suggest changing "Cal-OES" – in the first paragraph - to "Cal OES", both to be consistent with other mentions in the LHMP (including lower down on the same page) and since that is the official short reference format.

On page 4-19, Table 4-7 "Top 25 Employers – San Luis Obispo County", seems confusing to me ... as one example, relating to "San Luis Obispo County EMS", if that is referencing the Public Health Department's Emergency Medical Services division, I don't believe they have 1,000 – 4,999 employees; that number is correct, however, for the entire number of employees for all of the County of San Luis Obispo local government.

A similar comment relates to Table 4-7 as is carries over to page 4-20 – there is a listing for both "San Luis Obispo County Social" and, separately, for "Social Services Department", both shown as Government Offices - County. Also for "Sheriff" is Sheriff an actual industry, as shown????

On page 4-21, Section 4.7 Transportation, a couple of things: on a minor note, Greyhound lines no longer serves San Luis Obispo County (the nearest Greyhound bus service stops are in Santa Maria to the south of our county and King City to the north). Orange Belt operates Amtrak bus service, but they are still here, I think just in that capacity; but they are still here

On a perhaps more important note, there has been a significant and notable increase in air service at the noted regional airport, with the County and local business groups significantly involved in such increased service, thus widespread publicity and interest; including the relatively recent completion of the new (November 2017) terminal at a cost of nearly \$40,000,000. If I could be so bold to suggest, perhaps the below new wording might work – just a suggestion, of course; I could not do strikeout here, so this is just my suggested replacement wording, which begins after "... the Union Pacific Railroad"):

4.7 Transportation Systems The County contains major transportation arteries including U.S. Highway 101, California State Highways 1, 41, 46, 58, and 166, and the Union Pacific Railroad. No change to this sentence the below is a suggestion for the rest of this paragraph:

Suggestion: The County operates the San Luis Obispo County Regional Airport near the southern portion of San Luis Obispo. Commercial air service is offered by four airlines with direct flights to seven cities, with additional destinations planning to be added. In addition to air transportation, the county is also served with scheduled rail and bus service by Amtrak. Tour coach bus operators also serve the county, as do Regional Transit Authority and other local bus services.

As a side note – not part of my suggested wording, but as an FYI - the four airlines are United, American, Alaska and Contour with direct, non-stop service to San Francisco, L.A., Las Vegas, Phoenix, Denver, Dallas and Seattle. Non-stop service to start in 2020 includes Portland and San Diego ... however, since the LHMP "life span" might outlast some of these specifics, perhaps just the above general reference might work – again, just my humble thoughts! :)

In Section 4.4 on page 4.6, it is noted "The U.S. Census Bureau estimated San Luis Obispo County's total population of 280,119 as of 2017." That is repeated in closely following pages.

However, in Table 4-8 on page 4-22 the 2018 population is noted as 279,967. Not a biggie, but FYI.

And, similarly, near the bottom of page 5-27, a population of 283,405 is noted, and credits the U.S. Census Bureau, 2017. This repeats on page 5-28 ("The US Census Bureau estimated population of San Luis Obispo County for July 1, 2017 was 283,405, representing a 5.1% increase in population since 2010 (when it was estimated at 269,637)).

The top of page 5-6 reads: "San Luis Obispo is among the many communities in California that are susceptible to disaster." Perhaps instead?: The communities throughout San Luis Obispo County are among the many in California that are susceptible to disaster.

On Page 5-219, Brizzolara Creek is misspelled as Brizzolari Creek (in the City of San Luis Obispo paragraph).

Photo credit note: Figure 5-69 on page 5-232 notes its source as "Arroyo Grande Creek Channel Waterway Management Program, Final Report, 2010" – which I am sure it is taken from for use here – however the actual photo credit should be noted as "San Luis Obispo County OES, taken during storm damage assessment, March 2001".

The background is that I (Ron Alsop) took that photo from a CHP helicopter (CHP H-70) during a countywide damage assessment by air that the CHP assisted us with doing.

APPENDIX D: JURISDICTIONAL ADOPTION RESOLUTIONS

APPENDIX E: CRITICAL FACILITIES (ELECTRONIC)

APPENDIX F: CLIMATE CHANGE ADAPTATION PLANNING GUIDE CONSISTENCY SUMMARY

Climate Change Vulnerability Assessment - Refer to http://resources.ca.gov/docs/climate/01APG_Planning_for_Adaptive_Communities.pdf		
1) Exposure to:		Addressed in:
2) Sensitivity	Essential facilities	Section 5.2 Assets Summary; Section 5.3 applicable hazards Vulnerability-Critical Facilities and Infrastructure
	Transportation systems	Section 5.2 Assets Summary; Section 5.3 applicable hazards Vulnerability-Critical Facilities and Infrastructure
	Lifeline utility systems	Section 5.2 Assets Summary; Section 5.3 applicable hazards Vulnerability-Critical Facilities and Infrastructure
	High potential loss facilities	Section 5.2 Assets Summary; Section 5.3 applicable hazards Vulnerability-Critical Facilities and Infrastructure
	Hazardous material facilities	Section 5.2 Assets Summary; Section 5.3 applicable hazards Vulnerability-Critical Facilities and Infrastructure subsection; Section 5.3.16
	Vulnerable populations	Section 5.3 applicable hazards Vulnerability-People subsection
	Economic elements	Section 5.3 applicable hazards Vulnerability-Economy
	Areas of special consideration	Section 5.3 applicable hazards Climate Change Considerations subsection; applicable hazards Future Development subsection
	Historic, cultural, and natural resource areas	Section 5.2 Assets Summary; Section 5.3 applicable hazards Vulnerability-Historic, Cultural and Natural Resources subsection
	Other important facilities	Section 5.2 Assets Summary; Section 5.3 applicable hazards Vulnerability-Critical Facilities and Infrastructure subsection
3) Potential Impacts	Temporal extent of the impact	Section 5.3 applicable hazards Climate Change Considerations subsection
	Spatial extent of the impact	Section 5.3 applicable hazards Geographic Area and Extent subsections
	Permanence of the impact	Section 5.3 applicable hazards Vulnerability subsection
	Level of disruption to normal community function	Section 5.3 applicable hazards Vulnerability subsection
4) Adaptive Capacity	Identify actions in progress, or readily implemented to address the issue	Section 7.3 Mitigation Action Plan
	If not implemented, evaluate the time and resources needed for implementation	Section 7.3 Mitigation Action Plan
	Assess the extent to which the policy addresses potential impacts	Section 7.3 Mitigation Action Plan
	Note the degree to which the existing policy could be strengthened	Section 6.5 Opportunities for Enhancement
5) Risk and Onset	For each impact, assign a low, medium or high likelihood that a certain magnitude/extent/scale of potential impact will occur	Section 5.3 applicable hazards Hazard Risk Summary table
6) Prioritize Adaptive Needs	Create matrix of step 3 potential impact ratings and step 4 adaptive capacity ratings	Section 7.2.1 Identification and Analysis of Mitigation Actions
	Identify the level of certainty associated with climate change impacts from step 5	Section 5.3 applicable hazards Climate Change Considerations subsection
	Using this matrix, develop a list of adaptation impacts for strategy development	Section 7.2.1 Identification and Analysis of Mitigation Actions
7) Identify Strategies	Develop adaptation strategies (goals/policies/objectives)	Section 7.1 Goals and Objectives
8) Evaluate and Prioritize Strategies	Evaluate each strategy by cost, community co-benefits, duration of implementation, and social acceptance	Section 7.2.1 Identification and Analysis of Mitigation Actions
	Create a risk/uncertainty matrix to determine strategy implementation planning	Section 5.3 applicable hazards Hazard Risk Summary table
9) Phase and Implement	Identify the responsible party for implementation	Section 7.3 Mitigation Action Plan
	Identify funding	Section 7.3 Mitigation Action Plan
	Establish system for monitoring and sharing of information	Section 8.2.1 Maintenance/Monitoring Schedule
	Establish feedback loops	Section 8.2.2 Maintenance and Evaluation Process

APPENDIX G: REFERENCES

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