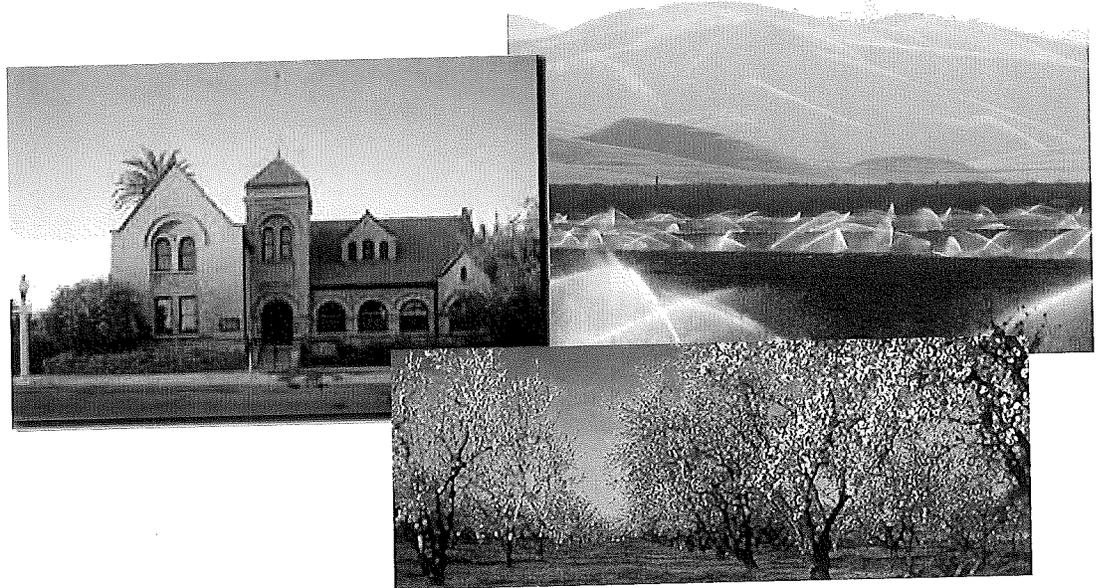


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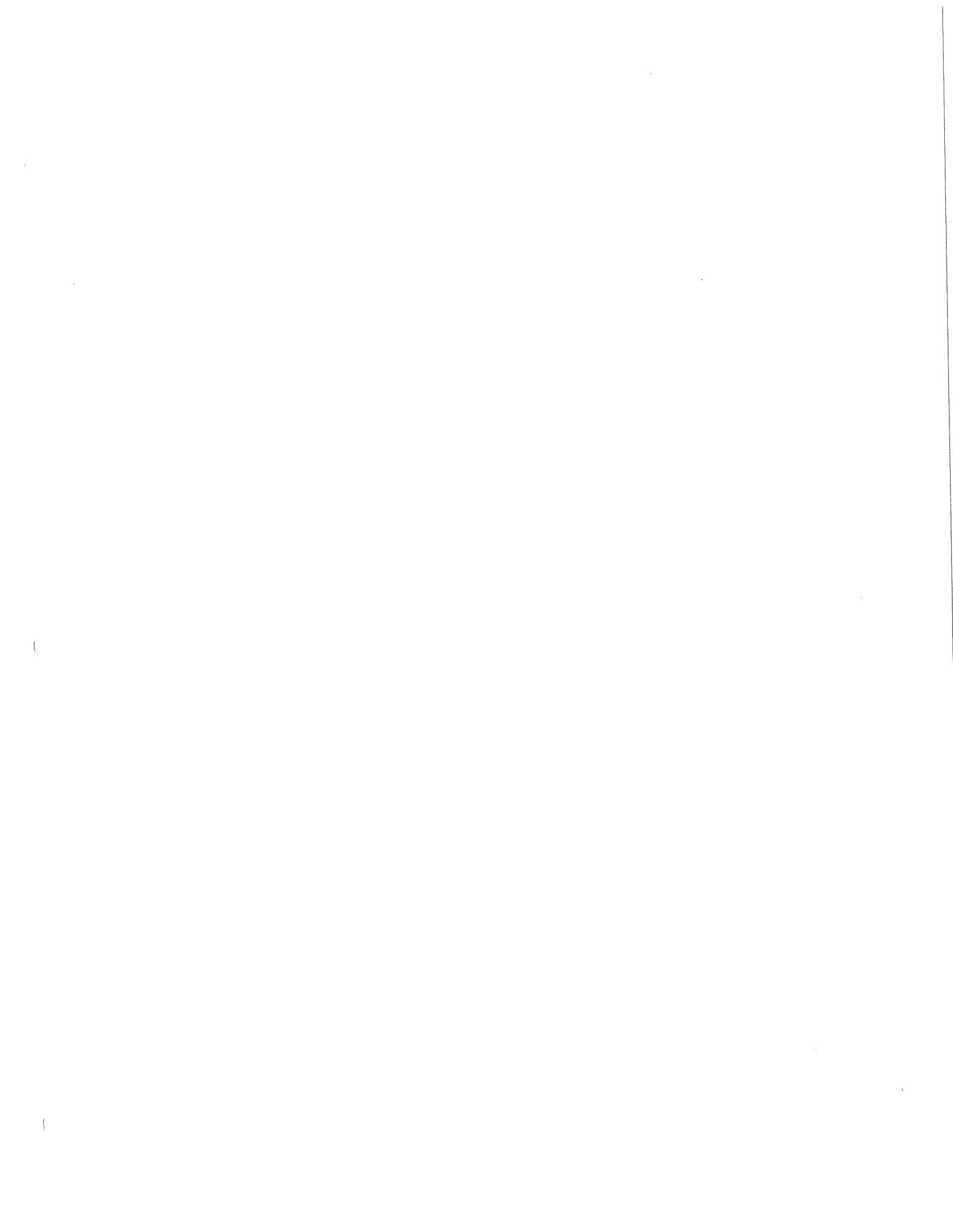
Kings County Multi-Jurisdictional Multi-Hazard Mitigation Plan



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October 2007

Developed by AMEC Earth and Environmental, Denver, CO
Hazard Mitigation and Emergency Management Programs



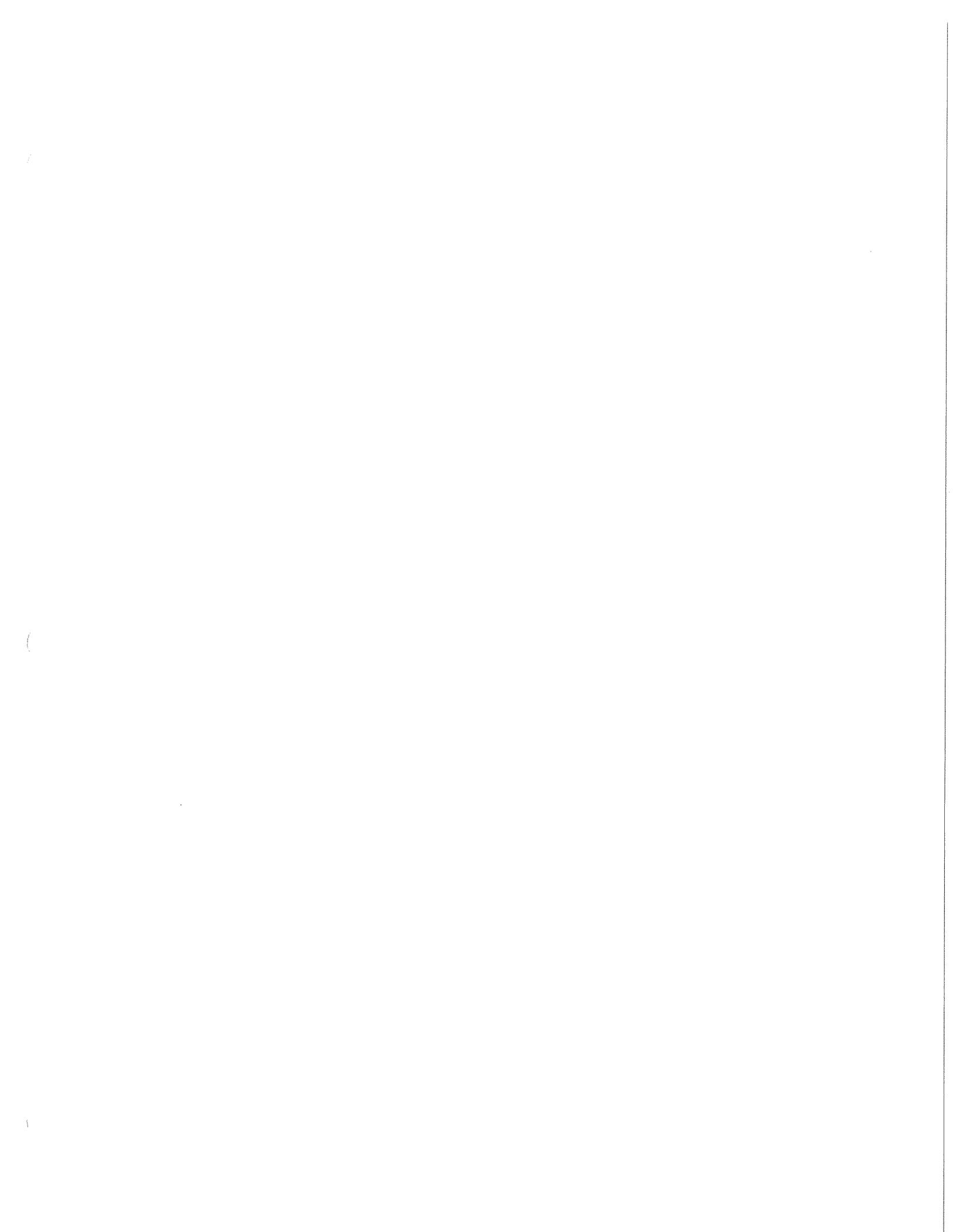
SPECIAL THANKS AND ACKNOWLEDGEMENTS

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Joe Neves	Kings County Board of Supervisors
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Terry Simmons	Tachi Yokut Tribe
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EXECUTIVE SUMMARY

The purpose of natural hazards mitigation is to reduce or eliminate long-term risk to people and property from natural hazards. Kings County and participating jurisdictions developed this multi-hazard mitigation plan to reduce future losses to the county and its communities resulting from natural hazards. The plan also was prepared to meet the requirements of the Disaster Mitigation Act of 2000 and to achieve eligibility for the Federal Emergency Management Agency (FEMA) Pre-Disaster Mitigation and Hazard Mitigation Grant Programs.

The Kings County Multi-Hazard Mitigation Plan is a multi-jurisdictional plan that covers the following local governments that participated in the planning process:

- Kings County
- City of Avenal
- City of Corcoran
- City of Hanford
- City of Lemoore
- Armona Community Services District
- Tulare Lakebed Reclamation Districts
 - Delta Lands Reclamation District No. 770
 - El Rico Reclamation District No. 1618
 - Lovelace Reclamation District No. 739
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 - Kings River-Hardwick School District
 - Kit Carson Elementary School District
 - Lakeside Union Elementary School District
 - Lemoore Union Elementary School District
 - Lemoore Union High School District

- Pioneer Union Elementary School District
- Reef-Sunset Unified School District

The planning process followed a methodology prescribed by FEMA, which began with the formation of a Hazard Mitigation Planning Committee (HMPC) comprised of key stakeholders from Kings County, participating jurisdictions, and state and federal agencies. The HMPC conducted a risk assessment to examine the recorded history of losses resulting from natural hazards, assess probability and magnitude of future hazard events, and analyze the county's assets at risk to hazards. The risk assessment indicated that earthquakes, floods, droughts, and extreme heat are the hazards most likely to significantly affect people and property in the county.

Based upon the risk assessment, the HMPC identified goals and objectives for reducing risk to natural hazards. The goals and objectives of this multi-hazard mitigation plan are to:

Goal 1 Reduce impacts of natural hazards to life, property, and the environment

- Promote education and awareness about natural hazards risk, mitigation, and preparedness to citizens, public agencies, elected officials, nonprofit organizations, and businesses
- Ensure protection and enhancement of key emergency access routes
- Protect critical facilities and infrastructure to minimize loss of critical services
- Minimize growth and development in hazard areas
- Improve enforcement of existing standards and regulations

Goal 2 Minimize impacts of natural disasters to agriculture and the economies of communities

- Encourage water conservation measures among urban, rural, and agricultural users
- Increase water storage to mitigate flooding and drought
- Develop plans for post-disaster recovery
- Strengthen disaster resistance and resiliency of major employers

Goal 3 Implement identified mitigation activities

- Promote hazard mitigation as integrated policy among communities in the county and with the region and state
- Increase communication regarding hazard mitigation among communities in the county.
- Seek funding sources and partners for future mitigation activities
- Improve organizational capabilities to address health and safety issues in mitigation and response

To meet identified goals and objectives, the plan recommends 26 mitigation actions, which are summarized in the table on the following page. The HMPC also developed an implementation plan for each action, which identifies priority level, background information, responsible agency, timeline, cost estimate, potential funding sources, and more.

The multi-hazard mitigation plan has been formally adopted by the Kings County Board of Supervisors and the governing bodies of each participating jurisdiction. It will be updated at a minimum of every five years.

SUMMARY OF MITIGATION ACTIONS

Mitigation Action	Links to Goals	Hazards Addressed	Kings County	Avenal	Corcoran	Hanford	Lemoore	ACSD	School Districts	Tulare Lakebed Districts
Improve coordination, planning, and investment in long-term water supplies to meet demands of ongoing growth and development	1, 2, 3	Drought, MH	X				X			
Enhance existing centralized, interjurisdictional GIS program to improve capabilities in mitigation, preparedness, and response for all hazards.	1, 2, 3	MH	X				X			
Assess vulnerability of critical infrastructure and lifeline utilities, including water distribution systems, to identify and prioritize projects for multi-hazard risk reduction.	1, 2	MH	X		X	X	X			
Assess vulnerability of critical facilities, including police/fire stations, hospitals, schools, and others, to identify and prioritize projects for multi-hazard risk reduction.	1, 2	MH			X	X	X			
Review and update items related to the Kings County Area Disaster Council in the Kings County Emergency Services Ordinance to improve countywide coordination and the monitoring and implementation of the mitigation plan.	3	MH	X				X			
Develop and implement a comprehensive strategy to improve ongoing public education regarding natural hazards and risk.	1, 3	MH	X				X			
Develop a program or system for supporting vulnerable populations during emergency events.	1, 3	MH	X	X	X		X			

Mitigation Action	Links to Goals	Hazards Addressed	Kings County	Avenal	Corcoran	Hanford	Lemoore	ACSD	School Districts	Tulare Labeled Districts
Implement natural hazards review criteria for new development to improve long-term loss prevention.	1, 2, 3	MH	X	X	X					
Integrate the hazard mitigation plan with the safety elements of general plans.	3	MH	X	X	X					
Update flood damage prevention ordinance to include new FEMA digital flood insurance rate maps.	1, 3	Flood	X	X			X			
Ensure the maintenance and enhancement of established disaster evacuation routes.	1, 2	MH	X							
Improve lighting and traffic controls at critical intersections and roadways to improve safety during fog events.	1	Fog	X							
Adopt the 2006 International Building Code to improve disaster-resistance of future buildings.	1, 2, 3	MH	X	X	X	X	X			
Develop a plan for supporting medically fragile and special needs students at each school site during emergency events.	1	MH	X						X	
Train school maintenance crews to identify and address nonstructural hazards in schools to mitigate earthquake risk.	1	Earthquake	X						X	
Establish a livestock disposal plan and compost team to address livestock fatality during extreme heat events.	1, 2	Extreme Heat	X							
Continue and enhance housing rehabilitation program.	1, 2	Earthquake		X						
Reduce vulnerability of water distribution system.	1, 2	Flood, Landslide		X						
Establish a loss reduction program for unreinforced masonry (URM) buildings in compliance with the California URM Law of 1986.	1	Earthquake	X							

Mitigation Action	Links to Goals	Hazards Addressed	Kings County	Avenal	Corcoran	Hanford	Lemoore	ACSD	School Districts	Tulare Lakebed Districts
Preserve open space in the floodplain through regulatory and nonregulatory methods.	1, 2, 3	Flood		X						
Expand the Veterans' Memorial Building and designate it as an emergency shelter.	1	Extreme Heat, MH			X					
Complete seismic retrofits of two of city's water storage tanks.	1,2	Earthquake				X				
Develop GIS database of unreinforced masonry (URM) buildings.	1, 2	Earthquake				X				
Retrofit 58 unreinforced masonry buildings in downtown Hanford.	1,2	Earthquake				X				
Install emergency power generator at Well No. 1	1, 2	MH						X		
Provide educational materials about natural hazards and risks in Kings County to customers in utility bills.	1, 3	MH						X		
Raise levee to improve protection of agricultural lands and property from flood hazards.	1, 2	Flood								X
Convert pump station to electric power to improve reliability of flood protection.	1, 2	Flood								X

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PREREQUISITES

44 CFR requirement 201.6(c)(5): The local hazard mitigation plan shall include documentation that the plan has been formally adopted by the governing body of the jurisdiction requesting approval of the plan. For multi-jurisdictional plans, each jurisdiction requesting approval of the plan must document that it has been formally adopted.

The following jurisdictions participated in the development of this plan and have adopted the multi-jurisdictional plan and their jurisdiction's annex. Resolutions of Adoptions are included on the following pages. (The plan will be adopted and resolutions included for each participating jurisdiction after preliminary approval from the California Office of Emergency Services and the Federal Emergency Management Agency.)

- Kings County, Lead Agency
- City of Avenal
- City of Corcoran
- City of Hanford
- City of Lemoore
- Armona Community Services District
- Tulare Lakebed Reclamation Districts
 - Delta Lands Reclamation District No. 770
 - El Rico Reclamation District No. 1618
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 - Island Union Elementary School District
 - Kings County Office of Education District
 - Kings River-Hardwick School District
 - Kit Carson Elementary School District
 - Lakeside Union Elementary School District
 - Lemoore Union Elementary School District

- Lemoore Union High School District
- Pioneer Union Elementary School District
- Reef-Sunset Unified School District

1. INTRODUCTION AND COUNTY DESCRIPTION

SCOPE

Natural hazards mitigation is defined as sustained action taken to reduce or eliminate long-term risk to human life and property from hazards. Natural hazards mitigation planning is the process through which natural hazards that threaten communities are identified, likely impacts of those hazards are determined, mitigation goals are set, and appropriate strategies that would lessen the impacts are determined, prioritized, and implemented. This plan documents the natural hazards mitigation planning process for Kings County, identifies natural hazards and risks within the county, and identifies the hazard mitigation strategy of the participating jurisdictions to reduce vulnerability and make the communities of Kings County more disaster resistant and sustainable. Information in this plan can be used to help guide and coordinate mitigation activities and local land use decisions.

The three **goals** of the Kings County Multi-Hazard Mitigation Plan are to:

- 1. Reduce impacts of natural hazards to human life, property, and the environment**
- 2. Minimize impacts of natural disasters to agriculture and the economies of communities**
- 3. Implement identified mitigation actions**

The Kings County Multi-Hazard Mitigation Plan is a multi-jurisdictional plan that covers the following incorporated communities that participated in the planning process:

- Kings County
- City of Avenal
- City of Corcoran
- City of Hanford
- City of Lemoore

This plan also covers additional special districts within Kings County that meet the FEMA definition of “local government” and participated in the planning process. These districts include:

- Armona Community Services District
- Tulare Lakebed Reclamation Districts
 - Delta Lands Reclamation District No. 770
 - El Rico Reclamation District No. 1618
 - Lovelace Reclamation District No. 739
 - North Central Consolidated Reclamation District No. 2071
 - South Central Reclamation District No. 2125
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- Kings County School Districts
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 - Kit Carson Elementary School District
 - Lakeside Union Elementary School District
 - Lemoore Union Elementary School District
 - Lemoore Union High School District
 - Pioneer Union Elementary School District
 - Reef-Sunset Unified School District

Representatives for each organization participating in the planning process are listed in Appendix B.

This plan addresses natural hazards only. Although the participants of the Kings County Hazard Mitigation Planning Committee (HMPC) recognize that the Federal Emergency Management Agency (FEMA) is encouraging communities to integrate human-caused hazards into the mitigation planning process, the scope of this effort did not address these hazards for two reasons. First, many of the planning activities for the mitigation of human-caused hazards are either underway or complete and are addressed in the emergency operations plan for the Kings County Operational Area. Secondly, the Disaster Mitigation Act of 2000 requires extensive public information and input, and this is in direct conflict with the confidentiality necessary in planning for chemical, biological, and radiological terrorism. The HMPC determined it was not in the community's best interest to publicly share specific information about the area's vulnerability to human-caused hazards.

PURPOSE OF PLAN

Each year, natural disasters in the United States take the lives of hundreds of people and injure thousands more. Nationwide, taxpayers pay billions of dollars each year to help communities, organizations, businesses, and individuals recover from disasters. These losses only partially reflect the true cost of disasters, because additional expenses to insurance companies and nongovernmental organizations are not reimbursed by tax dollars. Additionally, many natural disasters are predictable. Many more are repetitive, often with the same results. Many of the damages caused by these events can be alleviated or even eliminated.

FEMA, now a part of the U.S. Department of Homeland Security, has made reducing losses from natural disasters one of its primary goals. Hazard mitigation planning and subsequent implementation of projects, measures, and policies developed through those plans, is the

primary mechanism in achieving these goals. Mitigation planning has resulted in the implementation of projects that have successfully reduced disaster damages.

This plan was developed pursuant to the regulations of the Disaster Mitigation Act (DMA) of 2000. The DMA revises the Robert T. Stafford Disaster Relief and Emergency Assistance Act by adding Section 322, which provides new and revitalized emphasis on hazard mitigation, including a new requirement for local mitigation plans. These new local mitigation planning regulations are implemented through 44 CFR Part 201.6.

The DMA requires state and local governments to develop multi-hazard mitigation plans to maintain their eligibility for certain federal disaster assistance and hazard mitigation funding programs. Communities at risk from natural disasters cannot afford to jeopardize this funding.

More importantly, proactive mitigation planning at the local level can help reduce the cost of disaster response and recovery to property owners and government by protecting critical community facilities, reducing liability exposure, and minimizing overall community impacts and disruption. Kings County and its participating jurisdictions have been affected by several disasters in the past and are committed to reducing disaster impacts and maintaining eligibility for federal mitigation grant funding.

COUNTY DESCRIPTION

Kings County encompasses approximately 1,435 square miles. It is located slightly south of the geographic center of California and occupies part of the San Joaquin Valley and a portion of the eastern slope of the California Coast Ranges. The county is bounded on the southwest by the Coast Ranges, on the north and west by Fresno County, to the east by Tulare County, and to the south by Kern County.

Four incorporated cities occur in the county—Avenal, Corcoran, Hanford, and Lemoore—and four community service areas—Armona, Home Garden, Kettleman City, and Stratford. Kings County is also home to the Lemoore Naval Air Base, two state prisons, and the Tachi Yokut tribe, who live on 170 acres of tribal land at the Santa Rosa Rancheria. The Board of Supervisors is the governing body for Kings County and many county special districts.

Topography in most of the county is relatively flat. However, elevation ranges from a low of 175 feet above mean sea level in the Tulare Lake bed, to 3,500 feet above mean sea level in the southwest, near the Kettleman Hills and the Kreyenhagen Hills. The county is located in the Tulare Lake hydrologic region that comprises the extreme southern portion of the Central Valley. The rivers in this region include the Kings, Kaweah, Tule, and Kern, which all historically drained into the Tulare Lake. The climate in Kings County can be classified as Mediterranean with average rainfall rates of 7.6 inches annually, occurring primarily between November and April. A map of Kings County is provided in Figure 1.1.

Kings County is among the largest-producing agricultural counties in California (ranked 12th out of 58 counties) with a total of 617,030 acres in agricultural production. The gross value of all crops in the county exceeded \$1.4 billion in 2005. The county's leading commodity is milk.

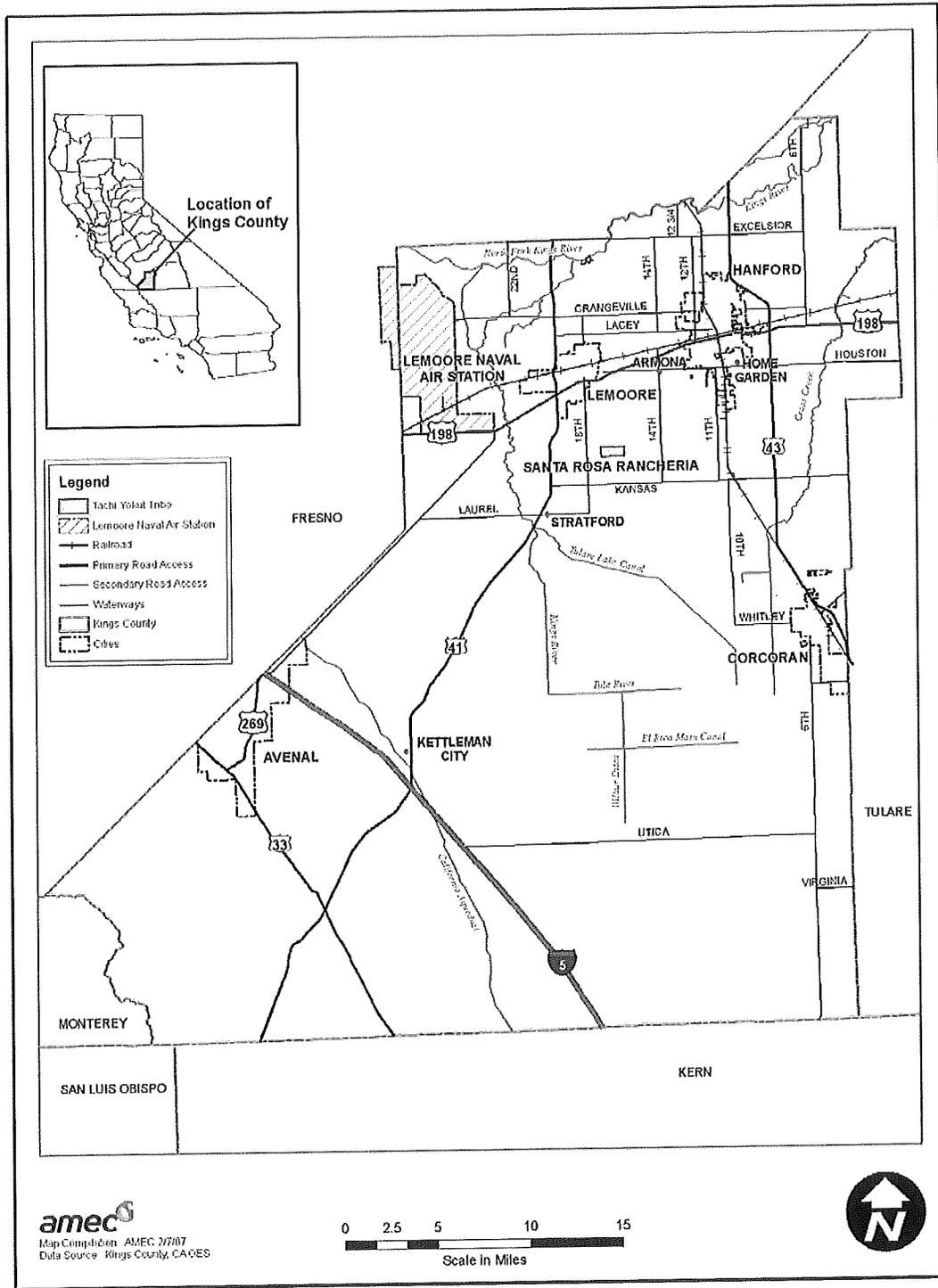
Kings County has grown at an average rate of 2.3 percent per year since the 2000 U.S. Census (a total of 14 percent). The estimated 2006 county population was 147,729 people. The largest city is the county seat, Hanford, with a population of 49,048. Kings County is projected to continue growing to a population of 198,700 in the year 2020 (California Department of Finance 2006). Population estimates for the year 2006 for each of the incorporated cities and the unincorporated county are provided in the table 1.1.

Table 1.1: Kings County 2006 Population Estimates

Community	Population
Avenal	16,349
Corcoran	23,448
Hanford	49,048
Lemoore	23,388
Unincorporated Area	35,496
County Total	147,729

Source: California Department of Finance, May 2006

Figure 1.1 Map of Kings County Planning Area



MULTI-JURISDICTIONAL PARTICIPATION

Each jurisdiction participating in this plan developed its own annex, which provides a more detailed assessment of each jurisdiction's unique risks, as well as their mitigation strategy to reduce long-term losses. Each jurisdictional annex addresses the following items:

- Community profile summarizing geography and climate, history, economy, and population
- Hazard information on location, extent, previous occurrences, and probability of future occurrences for geographically specific hazards
- Hazard map(s) at an appropriate scale for the jurisdiction, if available
- Number and value of buildings, critical facilities, and other community assets located in hazard areas, if available
- Vulnerability in terms of future growth and development in identified hazard areas
- Capability assessment describing existing regulatory, administrative, technical, and fiscal resources and tools, as well as outreach efforts and partnerships, and past mitigation projects
- Jurisdictional goals and objectives that differ from the plan's overall goals and objectives
- Mitigation actions specific to the jurisdiction

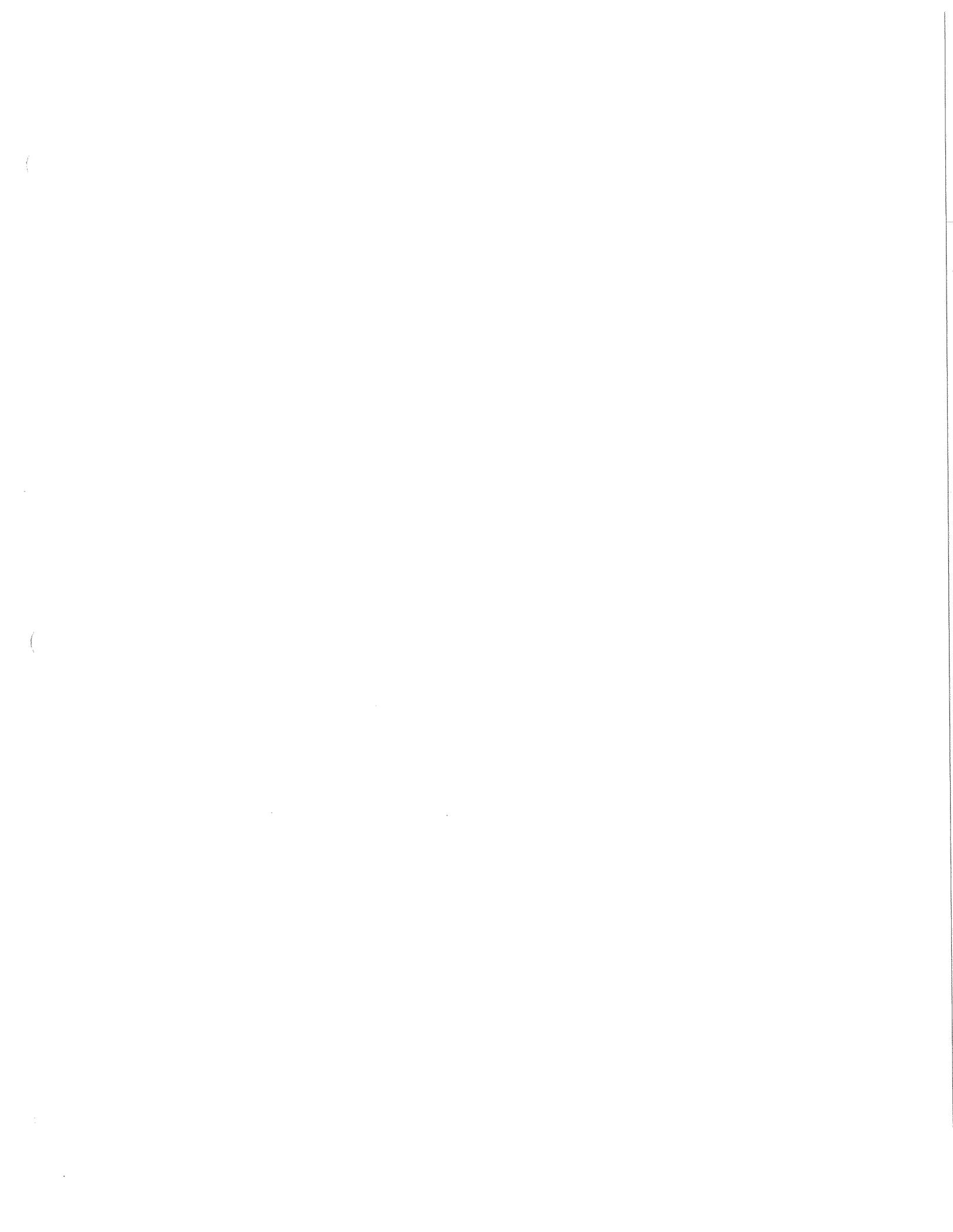
Each jurisdiction was required to meet strict plan participation requirements defined at the beginning of the process, which included the following:

- Designating a representative to serve on the Kings County Hazard Mitigation Planning Committee (HMPC)
- Participating in at least three of the four HMPC meetings
- Providing data and information to complete the jurisdictional annex, including identifying at least one mitigation action and completing action implementation worksheets.
- Reviewing and commenting 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 and annex
- Formally adopting the mitigation plan and the jurisdictional annex

All of the jurisdictions with annexes to this plan met all of these participation requirements. In most cases, the representative for each jurisdiction brought together a planning team to help collect data, identify mitigation actions and implementation strategies, and review annex drafts. The table below shows the attendance of representatives at each HMPC meeting; sign-in sheet are included in Appendix B.

Table 1.2: Participation in HMPC Meetings

Jurisdiction	Kickoff	Meeting #2	Meeting #3	Meeting #4
Kings County (unincorporated)	✓	✓	✓	✓
Avenal	✓	✓	✓	✓
Corcoran	✓	✓	✓	✓
Hanford	✓	✓	✓	
Lemoore	✓	✓	✓	✓
Armona Community Services Districts	✓	✓	✓	
School Districts	✓	✓	✓	✓
Tulare Lakebed Reclamation Districts	✓	✓	✓	✓



2. PLANNING PROCESS

44 CFR Requirement 201.6(c)(1): [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.

44 CFR Requirement §201.6(a)(3): Multi-jurisdictional plans may be accepted, as appropriate, as long as each jurisdiction has participated in the process and has officially adopted the plan.



The Kings County Fire Department and Office of Emergency Services recognized the need and importance of this plan and were responsible for its initiation and for securing funding. The county contracted with Robert Olson and Associates (ROA) and subcontractor, AMEC Earth and Environmental (AMEC), in October 2006 to facilitate and develop a multi-jurisdictional, multi-hazard mitigation plan. AMEC's role was to:

- Assist in establishing a Hazard Mitigation Planning Committee (HMPC) for the county that incorporates key stakeholders and representatives from each participating jurisdiction,
- Meet all of the planning requirements of the Disaster Mitigation Act (DMA) as established by federal regulations, following FEMA's planning guidance,
- Facilitate the planning process,
- Identify the data requirements that the HMPC can provide and conduct the research and documentation necessary to augment that data,
- Develop and facilitate the public input process,
- Produce the draft and final plan documents, and
- Coordinate the California Office of Emergency Services (CA-OES) and FEMA Region IX reviews of the plan and its formal adoption by the Kings County Board of Supervisors and the governing bodies of each of the participating jurisdictions.

AMEC and the Kings County Office of Emergency Services worked together to establish the framework and process for this planning effort using FEMA's *Multi-Hazard Mitigation Planning Guidance under the Disaster Mitigation Act of 2000* (2004) and the *State and Local Mitigation Planning How-To Guides* (2001), which includes the *Multi-Jurisdictional Mitigation Planning How-To Guide* (2006). The plan is structured around a four-phase process:

1. Organize Resources
2. Assess Hazards and Risks
3. Develop a Mitigation Plan
4. Evaluate the Work

The remainder of this chapter provides a narrative description of the steps taken to prepare the hazard mitigation plan.

PHASE 1: ORGANIZE RESOURCES

Step 1: Get Organized

The planning process officially began with a kickoff meeting in Hanford, California, on October 27, 2007. The Kings County Office of Emergency Services mailed letters of invitation to the kickoff meeting to county, municipal, district, state, and other stakeholder representatives. This list is included in Appendix B.

The DMA requires that each jurisdiction participate in the planning process and officially adopt the multi-jurisdictional hazard mitigation plan. A planning committee was created that includes representatives from each participating jurisdictions, officials/employees representing the appropriate departments of the county, and other members of the Kings County Operational Area responsible for making decisions in the plan and agreeing upon the final contents. Kickoff meeting attendees discussed potential participants and made decisions about agencies to invite to participate on the Hazard Mitigation Planning Committee (HMPC).

The agencies whose representatives participated on the HMPC are listed below. The committee contributed to this planning process by providing facilities for meetings, attending meetings, collecting data, managing administrative details, and reviewing drafts.

- Kings County Fire Department
- Kings County Office of Emergency Services
- Kings County Board of Supervisors
- Kings County Department of Public Health
- Kings County Planning/GIS
- Kings County Administration
- Kings County Agricultural Commissioner
- Kings County Office of Education (school districts)
- California Office of Emergency Services (Fresno office)
- City of Corcoran (Police Department)
- City of Hanford (Fire Department)
- City of Lemoore (Police Department)
- City of Avenal (City Manager/ Emergency Manager)
- Tachi Yokut Tribe
- Armona Community Services District
- Tulare Lakebed Reclamation Districts
- Kings River Conservation District
- Cross Creek Flood Control District

The HMPC communicated during the planning process with a combination of face-to-face meetings, phone interviews, email correspondence, and a FTP (file transfer protocol) site. The meeting schedule and topics are listed in the following table. The sign-in sheets and agendas for each of the meetings are included in Appendix B.

Table 2.1 Schedule of HMPC Meetings

HMPC Meeting	Meeting Topic	Meeting Date
1	Introduction to DMA/Kickoff Meeting	October 27, 2006
2	Summary of Risk Assessment	February 22, 2007 AM
3	Development of Goals and Objectives	February 22, 2007 PM
4	Identification and Prioritization of Mitigation Actions	March 28, 2007

During the kickoff meeting, AMEC presented information on the scope and purpose of the plan, participation requirements of HMPC members, and the proposed project work plan and schedule. A plan for public involvement (Step 2) and coordination with other agencies and departments (Step 3) were discussed. AMEC also introduced preliminary hazard identification information for the county, and HMPC members refined the list of identified hazards. Participants were provided worksheets to facilitate the collection of information needed to support the plan, such as data on historic hazard events, values at risk, and current capabilities.

Step 2: Plan for Public Involvement

44 CFR Requirement 201.6(b): 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.

The HMPC undertook several strategies to engage the public in the planning process. At the kickoff meeting, the team discussed a plan and options for soliciting public input. An email letter announcing the beginning of the planning process and the kickoff meeting was distributed to key stakeholders.

The county and each incorporated city identified when and how they would involve the public. Kings County and Corcoran held public meetings. Corcoran advertised their meeting in the *Corcoran Journal*. Kings County advertised their meeting by flyers placed in each unincorporated area of the county (Armona, Kettleman City, Home Garden, and Stratford) at fire stations, libraries, and/or posted in grocery stores and other places frequented by local residents. The purpose of these meetings was to explain the purpose and process of the plan, the results of the risk assessment, and to gather feedback on priorities and potential issues related to risk reduction. Meeting dates are provided in the table below.

Table 2.2: Schedule of Public Meetings

Jurisdiction	Location	Meeting Date
Corcoran	Corcoran City Hall	February 21, 2007
Kings County	Board of Supervisors Chambers, Hanford	March 29, 2007

Once the first draft of the multi-jurisdictional plan and annexes had been developed, Kings County made it available on their website at www.countyofkings.com. A hard copy was also

available at the following locations: Kings County Fire Department (Hanford), Avenal City Manager's Office, Corcoran Fire Department, and Lemoore City Manager's Office. The jurisdictions announced the availability of the draft plan and the public comment period in the *Hanford Sentinel*. A copy of the notice is provided in Appendix B.

The HMPC invited other specific stakeholders to comment on the draft of plan by letter, which is described in greater detail in the next planning step. Stakeholder and public comments were compiled and distributed to the planning team via email for discussion and consideration. Appropriate responses were integrated into the final draft of the plan. Record of public input, HMPC responses, and sign-in sheets are on file with the Kings County Office of Emergency Services.

Step 3: Coordinate with Other Departments and Agencies

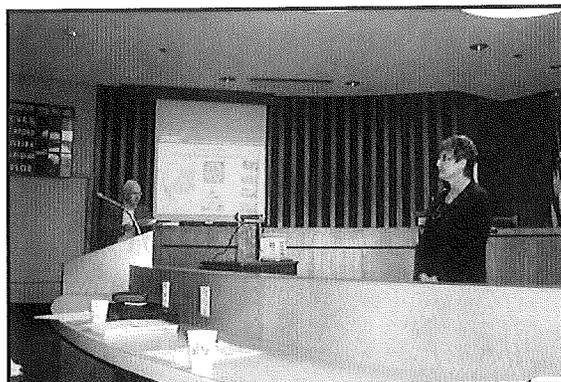
44 CFR Requirement 201.6(b): An open public involvement process is essential to the development of an effective plan. In order to develop a more comprehensive approach to reducing the effects of natural disasters, the planning process shall include: (2) An opportunity for neighboring communities, local 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. (3) Review and incorporation, if appropriate, of existing plans, studies, reports, and technical information.

There are numerous organizations whose goals and interests interface with hazard mitigation in Kings County. Coordination with these organizations and other community planning efforts is paramount to the success of this plan. The Kings County Office of Emergency Services invited other departments and agencies in Kings County to the kickoff meeting to learn about the hazard mitigation planning initiative being undertaken. Many of the agencies participated throughout the planning process on the HMPC and were listed previously in Step 1: Organize Resources. A representative from each participating jurisdiction worked with the departments and agencies of their jurisdiction to collect data; assess hazards, vulnerability, and capability; and develop a mitigation strategy.

In addition, the HMPC developed a list of neighboring communities, local and regional agencies involved in hazard mitigation activities, as well as other interests, to invite by letter to review and comment on the draft of the Kings County Hazard Mitigation Plan. A copy of this letter is provided in Appendix B. The comments resulting from this effort were incorporated into the plan, as appropriate. The stakeholders invited to comment on the plan were the following:

- Kings County Hazard Mitigation Planning Committee
- Kings County Board of Supervisors
- Avenal City Council
- Corcoran City Council
- Hanford City Council
- Lemoore City Council
- Heads of County Departments

- Heads of City Departments
- Kings County Community Action Organization
- Kings County Commission on Aging
- Hanford Community Medical Center
- JG Boswell Company
- Del Monte Foods
- Leprino Foods
- Westlake Farms
- Kings County Water District
- Kings River Conservation District
- Westlands Water District
- Tachi Yokut Tribe - Casino
- Tachi Yokut Tribe – Santa Rosa Rancheria
- Kern County Office of Emergency Services
- Tulare County Office of Emergency Service
- Fresno County Office of Emergency Services
- California Office of Emergency Services (Fresno Office)
- Corcoran State Prisons
- Avenal State Prison
- Lemoore Naval Air Station
- U.S. Bureau of Reclamation (Fresno office)
- National Weather Service – Hanford Station
- American Red Cross



Trudy Maletta, chair of the HMPC, addresses the committee during a planning meeting



Kickoff meeting for the hazard mitigation plan

As part of the coordination with other agencies, the HMPC collected and reviewed existing technical data, reports, and plans. Kings County and the cities located there use a variety of comprehensive planning mechanisms, such as land use and general plans, emergency operations plans, and municipal ordinances and building codes, to manage community growth and development. This information was used in the development of the hazard identification, vulnerability assessment, and capability assessment and in the formation of goals, objectives, and mitigation actions. These sources are documented throughout the plan and specifically in the capability assessment sections of each jurisdictional annex.

PHASE 2: ASSESS HAZARDS AND RISK

Step 4: Identify and Profile the Hazards

AMEC assisted the HMPC in a process to identify the natural hazards that have or could impact communities in Kings County. Data collection worksheets were distributed at the kickoff meeting to help identify hazards and vulnerabilities. The internet, existing reports and plans, and existing geographic information systems (GIS) layers were used to research past hazard events and determine the location, extent, magnitude, and future probability of identified hazards. More information on the methodology and resources used to identify and profile the hazards can be found in Sections 3.1 and 3.2.

Step 5: Assess the Risks

After profiling the hazards that could affect Kings 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 inventoried 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, cultural, and historic assets; economic assets; and vulnerable populations. The HMPC also analyzed development trends in hazard areas. FEMA's loss estimation computer software, HAZUS-MH, was used to estimate potential losses due to earthquake events affecting Kings County.

Capability Assessment – This assessment consisted of identifying the existing mitigation capabilities of participating jurisdictions. This involved collecting information about existing government programs, policies, regulations, ordinances, and plans that mitigate or could be used to mitigate risk to disasters. Participating jurisdictions collected information on their regulatory, personnel, fiscal, and technical capabilities, as well as ongoing initiatives related to interagency coordination and public outreach.

AMEC provided the draft risk assessment for the HMPC in early February 2007 for review and comment. Results of the Risk Assessment were presented and comments discussed at the second meeting of the HMPC.

PHASE 3: DEVELOP THE MITIGATION PLAN

Step 6: Identify Goals and Objectives

AMEC facilitated a brainstorming and discussion session with the HMPC during their third meeting to identify goals and objectives for the overall multi-jurisdictional mitigation plan. The planning team for each participating jurisdiction discussed these goals and changed them as needed to reflect the unique needs of their community. Goals and objective for the multi-jurisdictional plan are presented in Chapter 4 and any changes to the goals of specific jurisdictions are included in their annex.

Step 7: Develop Potential Mitigation Actions

The HMPC participated in brainstorming and prioritization processes to develop their mitigation actions at the fourth meeting. The group identified a comprehensive range of mitigation alternatives, and then narrowed down and prioritized these selected actions based on the STAPLEE criteria, which assesses the social, technical, administrative, political, legal, economic, and environmental implications of each action.

The group also identified the responsible agency for implementing each action. The identified agencies then completed a mitigation action implementation worksheet for each one. The purpose of these worksheets are to provide information on the background information, ideas for implementation, responsible agency, partner agencies, timeline, budget, and more for each identified action.

PHASE 4: EVALUATE THE WORK

Step 8: Draft the Mitigation Plan

A first draft of the plan was developed for review by the HMPC. Once the committee's comments were incorporated, a second draft was made available online and in hard copy for review and comment by the public and other agencies and interested stakeholders. These comments were integrated into a final draft for submittal to CA-OES and FEMA.

Step 9: Adopt the Plan

To secure buy-in and officially implement the plan, the governing bodies of each participating jurisdiction adopted the plan and their jurisdictional annex. Scanned copies of resolutions of adoption are included in the Prerequisites section at the beginning of this plan.

Step 10: Implement and Maintain the Plan

The HMPC developed an overall strategy for plan implementation and for monitoring and maintaining the plan over time. This strategy is described in Chapter 5.

3. RISK ASSESSMENT

44 CFR 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 to natural hazards is a combination of hazard, vulnerability, and capability. This chapter will examine hazards and vulnerability. Jurisdictional annexes to the plan discuss the capabilities for each of the participating jurisdictions.

The risk assessment process identifies and profiles relevant hazards and assesses the exposure of lives, property, and infrastructure to these hazards. The goal of the risk assessment is to estimate the potential loss in Kings County, including loss of life, personal injury, property damage, and economic loss, from a hazard event. The risk assessment process allows communities in Kings County to better understand their potential risk to natural hazards and provides a framework for developing and prioritizing mitigation actions to reduce risk from future hazard events.

The risk assessment for Kings County and its jurisdictions followed the methodology described in the FEMA publication 386-2, *Understanding Your Risks – Identifying Hazards and Estimating Losses* (2002), which includes a four-step process:

1. Identify Hazards
2. Profile Hazard Events
3. Inventory Assets
4. Estimate Losses

This chapter is divided into three parts: hazard identification, hazard profiles, and vulnerability assessment:

- Hazard Identification—This section identifies the hazards that threaten the planning area and describes why some hazards have been omitted from further consideration.
- Hazard Profiles—This section describes previous occurrences of hazard events and the probability of future occurrence, including location, magnitude, and extent.
- Vulnerability Assessment—This section combines the final two steps of FEMA's process and assesses the county's total exposure to natural hazards, considering assets at risk, critical facilities, social vulnerability and estimating potential losses and assessing development trends. The hazards that vary geographically across the planning area are addressed individually and in greater detail.

3.1 HAZARD IDENTIFICATION

Methodology

The hazard identification addresses step one of FEMA's four-step process for conducting risk assessments:

1. Identify Hazards
2. Profile Hazard Events
3. Inventory Assets
4. Estimate Losses

During the first meeting of the Hazard Mitigation Planning Committee (HMPC) for Kings County, the group reviewed data from the following sources on hazards affecting the planning area:

- Disaster declaration history from the California Governor's Office of Emergency Services (CA-OES) and FEMA
- California State Multi-Hazard Mitigation Plan (2004)
- Information on past hazard events from the Spatial Hazard Event and Loss Database (SHELDUS), a component of the University of South Carolina Hazards Research Lab, that compiles county-level hazard data for 18 different natural hazard event types
- Information on past extreme weather and climate events from the National Oceanic and Atmospheric Administration's (NOAA) National Climatic Data Center
- Safety element of the Kings County General Plan (1993)

The HMPC discussed and came to consensus on significant hazards to the county. Each participating jurisdiction completed a hazard identification worksheet. The results of these worksheets are summarized in Table 3.1 on the following page.

The HMPC agreed not to address manmade hazards, which will be addressed in emergency operations plans currently being developed and updated for the county, four cities, and the Tachi Yokut tribe.

The HMPC identified 10 natural hazards that significantly affect the planning area. These hazards are profiled in further detail in the next section and are listed in Table 3.1, along with a checkmark indicating the jurisdictions impacted by the hazard.

Table 3.1: Hazards Identified for each Participating Jurisdiction

Hazard	Kings County*	Avenal	Corcoran	Hanford	Lemoore	Armona CSD	School Districts	Tulare Lakebed Districts
Dam Failure	✓		✓	✓	✓	✓	✓	✓
Drought	✓	✓	✓	✓	✓	✓	✓	✓
Earthquake	✓	✓	✓	✓	✓	✓	✓	✓
Extreme Heat	✓	✓	✓	✓	✓	✓	✓	✓
Flood	✓	✓	✓	✓	✓	✓	✓	✓
Fog	✓	✓	✓	✓	✓	✓	✓	✓
Freeze	✓	✓	✓	✓	✓	✓	✓	✓
Landslide	✓	✓					✓	
Tornado	✓		✓	✓	✓	✓	✓	✓
Wildfire	✓	✓					✓	

Source: Kings County Hazard Mitigation Planning Committee, 2007. *Unincorporated areas.

Non-Profiled Hazards

The HMPC reviewed data and discussed several other hazards, which were eliminated from further discussion because they occur rarely and/or their impacts are not significant. Table 3.2 lists these hazards and provides a brief explanation for their omission from further profiling.

Table 3.2: Hazards Not Profiled in the Plan

Hazard	Explanation for Omission
Avalanche	Snowfall is extremely rare to nonexistent across the planning area.
Coastal Erosion/Storm	Hazard does not occur due to distance from coasts and ocean.
Hailstorm	Severe thunderstorms during which hail normally occurs are rare.
Hurricane	Hazard does not occur due to distance from ocean.
Land Subsidence	Land subsidence does occur in many areas but primarily affects water wells, which local agencies address.
Tsunami	Hazard does not occur due to distance from ocean.
Severe Winter Storm	Very little to no snowfall recorded throughout county; temperatures fall below 32 degrees Fahrenheit only a few days of the year.
Windstorm	High winds occur but are not common and do not cause significant damages.
Volcano	The U.S. Geological Survey does not include Kings County in their map of areas identified as subject to hazards from potential eruptions in California.

Source: Kings County Hazard Mitigation Planning Committee, 2007.

3.2 HAZARD PROFILES

44 CFR Requirement §201.6(c)(2)(i): The risk assessment shall include a description of the type, location, and extent of all natural hazards that can affect the jurisdiction. The plan should include information on previous occurrences of hazard events and on the probability of future hazard events.

Methodology

The hazard profiles section addresses step two of FEMA's four-step process for conducting risk assessments:

1. Identify Hazards
- 2. Profile Hazard Events**
3. Inventory Assets
4. Estimate Losses

The hazards identified in Kings County by the HMPC are profiled in this section. Hazard profiles provide information on the hazard description, extent and magnitude, previous occurrences, and probability of future occurrence. The sources used to collect this information for Kings County included the following:

- Disaster declaration history from the California Governor's Office of Emergency Services (CA-OES) and FEMA
- California State Multi-Hazard Mitigation Plan (2004)
- Internet resources on past hazard events, such as the SHELDUS database created by the University of South Carolina Hazards Research Lab and the National Climatic Data Center, a component of the National Oceanic Atmospheric and Administration.
- Kings County Emergency Operations Plan (2002) and the safety element of the Kings County General Plan (1994)
- Geographic information systems (GIS) data from CA-OES and other state agencies, the U.S. Geological Survey, and the Kings County Planning Department
- Worksheets completed by each participating jurisdiction profiling hazards in their area

A detailed profile for each of the identified hazards compiles information on the following characteristics of the hazard:

Hazard Description

A general description of the hazard and the types of impacts it may have on a community are provided in this section.

Geographic Extent and Potential Magnitude

This section describes the potential severity of disaster and any secondary events caused by the hazard and the extent or location of the hazard in the planning area. Magnitude is classified by the following:

- Catastrophic:** More than 50 percent of the planning area affected
- Critical:** Between 35-50 percent of the planning area affected
- Limited:** 10-25 percent of the planning area affected
- Negligible:** Less than 10 percent of the planning area affected

Previous Occurrences

This section includes information on historic incidents, including impacts, if known. A historic incident worksheet was used to capture information from participating jurisdictions on past occurrences. Information from the HMPC was combined with other data sources such as the National Weather Service.

Probability of Future Occurrences

The frequency of past events is used to gauge the likelihood of future occurrences. Based on historical data, the probability of future occurrences is categorized into one of the following classifications:

- Highly Likely:** Near 100 percent chance of occurrence next year or happens every year
- Likely:** Between 10 percent and 100 percent chance of occurrence in next year or has a recurrence interval of 10 years or less
- Occasional:** Between 1 percent 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

The probability, or chance of occurrence, was calculated where possible based on existing data. Probability was determined by dividing the number of events observed by the number of years and multiplying by 100. This gives the percent chance of the event happening in any given year. An example would be three droughts occurring over a 30-year period, which suggests a 10 percent chance of that hazard occurring in any given year.

The remainder of this section begins with an overview of the history of declared disasters in Kings County followed by the profiles of identified hazards. At the end of the section, tables summarize potential magnitude and probability of occurrence information for each jurisdiction.

Disaster Declaration History

One method to identify hazards based upon past occurrence is to examine the events that triggered federal and/or state disaster declarations that included Kings County. Disaster declarations are granted when the severity and magnitude of the event's impact surpass 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 of sufficient magnitude and severity that both the local and state governments' capacity are exceeded, a federal disaster declaration may be issued, allowing for the provision of federal disaster assistance.

Table 3.3 lists in chronological order the disasters that received state and/or federal disaster declarations for which Kings County was designated. Many of the disaster events occurred beyond the county on a regional or statewide basis; therefore, reported injuries, fatalities, and economic damages are not an accurate estimate for only Kings County.

Table 3.3: Disaster Declaration History in Kings County, 1950-Present

Hazard Type	Disaster Name	Disaster Number	State Declaration	Federal Declaration	Number of Deaths	Number of Injuries	Costs
Flood	1969 Storms	OEP DR-253	01/29/69	01/26/69	47	161	\$300 million
Flood	Heavy Snow Runoff	OEP DR-2270	01/28/69	08/15/69			\$2.8 million
Severe Storm, Freeze	Freeze/ Severe Weather		04/17/72	not declared			\$111.5 million
Drought	1976 Drought		02/13/76	not declared			\$2.66 billion
Severe Storms	Winter '78 Storms	DR-547	02/27/78	02/15/78	14	21	\$117.8 million
Flood	Winter Storms	DR-682	03/03/83	02/09/83			\$523.6 million
Severe Storm	Severe Winter Storms	DR-1044	01/17/95	01/13/95	11		\$741.4 million
Severe Storm, Flood	Late Winter Storms	DR-1046		01/10/95			\$1.1 billion
Flood	January 1997 Floods		01/31/97		8		\$1.8 billion
Flood	El Nino		02/02/98	Kings not declared	17		\$550 million
Freeze	Freeze	DR-1267	02/09/99	02/09/99			
Freeze	Severe Freeze	DR-1689	3/13/2007	3/13/2007			

Source: California Governor's Office of Emergency Services, 2007.

Note: Many declarations are multi-county; costs are not just for Kings County.

The majority of declarations and all but two federal disaster declarations were declared for severe storms and flooding. These occurred twice in 1969, once each in 1978 and 1983, and twice in 1995. A federal disaster declaration for freeze in February was declared in 1999 and in 2007. The remaining declaration was a state declaration for drought in 1976. According to the California State Multi-Hazard Mitigation Plan (CA-SHMP), there were not any California proclaimed states of emergency for agricultural emergencies or landslides in Kings County from 1950-1997, and there were two California proclaimed states of emergency for drought (2004).

The HMPC defined severe winter storms as characterized by unusual amounts of snow and ice that may or may not be accompanied by extreme cold. Such events are extremely uncommon in Kings County and are not included in the list of identified hazards. However, in the disaster declaration table, several events are named by CA-OES as severe winter storm events. These events are named as such because they occur in the winter season. In Kings County, they most often take the form of heavy rain and flooding and are discussed further in the flood hazard section.

The federal government may also issue a disaster declaration through the U.S. Department of Agriculture (USDA) and/or the Small Business Administration, as well as through FEMA. The quantity and types of damage are the determining factors. A USDA declaration makes all qualified farm operators in the designated areas eligible for low-interest emergency loans from the USDA's Farm Service Agency. As part of an agreement with the USDA, the Small Business Administration offers low interest loans for eligible businesses that suffered economic losses in declared and contiguous counties. In 2005 and 2006, Kings County received USDA emergency designations twice for heat waves and once each for rainfall and drought.

The profiles for each of the identified hazards are listed below in alphabetical order. Dam failure is addressed in the flood section due to its similar impacts.

Drought

Hazard Description

Drought is a complex issue that is best defined regionally based on its effects:

- **Meteorological**—a period of below average water supply
- **Agricultural**—inadequate water supply to meet the needs of the state's crops and other agricultural operations such as livestock
- **Hydrological**—deficiencies in surface and subsurface water supplies, generally measured as stream flow, snowpack, and lake, reservoir, and groundwater levels
- **Socioeconomic**—when drought affects health, wellbeing, and quality of life or when it starts to have an adverse economic impact on a region (National Drought Mitigation Center 2006)
- **Regulatory**—mandatory compliance with environmental protection laws (especially those pertaining to protection of endangered species), combined with low precipitation and runoff, create deficiencies in agricultural and/or urban water supplies

Drought is a gradual phenomenon that differs from typical emergency events. Many natural disasters, such as floods or earthquakes, occur relatively rapidly with little time to prepare for disaster response. Droughts occur slowly, often over a multiyear period, and it is hard to determine when a drought begins or ends. Impacts of drought are typically felt first by those most reliant on annual rainfall, such as ranchers engaged in dryland grazing, rural residents relying on wells in low-yield rock formations, or small water systems lacking a reliable source. Criteria used to identify statewide drought conditions do not address these localized impacts (California Department of Water Resources 2006).

The drought issue is further compounded by water rights specific to any state or region. Water is a commodity possessed under a variety of legal doctrines. The prioritization of water rights between agriculture and federally-protected fish habitat in the state is also at issue.

Geographic Extent and Potential Magnitude

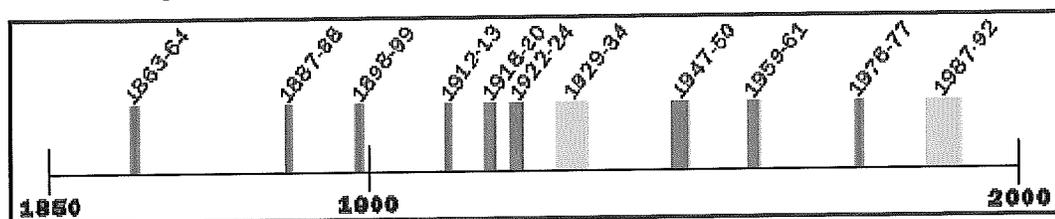
Droughts are generally widespread events that could affect all of Kings County and surrounding counties. Impacts include water restrictions associated with domestic supplies, agricultural and livestock losses and economic impacts, hydroelectric power reductions, and increased costs for water. Secondary effects include susceptibility to wildfires and increased groundwater pumping that can contribute to land subsidence problems and degraded water quality.

The magnitude of a drought's impact is directly related to the severity and length. Droughts can be a short-term event over several months or a long-term event that lasts for years or even decades. In Kings County, the onset of drought is often signalled by a lack of significant winter precipitation and snowfall in the Sierra Nevada Mountains. Hot and dry conditions that persist into spring, summer, and fall can aggravate drought conditions, making the effects of drought more pronounced as water demands increase during the growing season and summer months. Impacts increase with the length of a drought, as carry-over supplies in reservoirs are depleted and water levels in groundwater basins decline (California Department of Water Resources 2006).

Previous Occurrences

Historically, California has experienced severe drought conditions. The state's available record for determining hydrologic risks is short, only going back about 100 years. Figure 3.1 shows the history of multiyear droughts in California from 1850-2000.

Figure 3.1: California's Multiyear Historical Dry Periods: 1850-2000



Source: California Department of Water Resources, 2000.

Recent droughts affecting Kings County are summarized below using data from CA-OES and from the U.S. Geological Survey (USGS) *Summary of Floods and Droughts in the Southwestern States* (2004):

- **1928-1937**—This drought affected the entire state and is the longest, most severe drought on record with a recurrence interval of greater than 100 years.
- **1947-1950**—Drought affected the entire state but was most extreme in Southern California. The drought in winter of 1950 affected the area from the Kern River basin north to the American River basin. The drought caused two deaths and \$33 million in damages.
- **1976-1977**—The drought of 1976-1977 was most severe in the northern three-quarters of California, but the impact was experienced statewide because of the dependence of southern California on water transfers from the north. The water year 1977 was the driest year of record at almost all gauging stations in the affected area in California, and the water year 1976 was among the five driest in the central and northern Sierra Nevada. The two-year deficiency in runoff accumulated during the drought is unequaled at gauging stations in the affected area; and this deficiency has a recurrence interval that exceeds 80 years. Crop damages statewide were \$2.67 billion.
- **1987-1992**—During this multiyear, multi-county drought, the runoff from the San Joaquin Valley was 47 percent of average. In 1991, the U.S. Department of Agriculture Economic Research Report *Agricultural Outlook* reported that the Kings River flow would be inadequate to provide sufficient water for agricultural uses for the fifth consecutive year. A USDA drought disaster declaration was declared.
- **2004-2005**—On January 26, 2005, the USDA designated Kings County a primary disaster area due to drought that had occurred since January 1, 2004.

Probability of Future Occurrences

Based on the historical record, 14 droughts (multiyear events counted as one) have occurred in California since 1862 (143 years). This indicates that California experiences drought on average every 10 years, which is a 10 percent chance of occurring in any given year. In Kings County, four multiyear droughts are on record for the last 56 years, which averages to an event every 14 years, or about a 7 percent chance of occurrence in any given year. Based on these probabilities, drought will continue to occur **occasionally** in the future.

The Colorado River Basin Climate Report (2005) discusses the 'perfect drought' that could occur in Southern California when a local drought increases water demand and decreases water supplies and storage at the same time that the Northern California and Colorado River Basin imported water sources are impacted by droughts, and these conditions persist for several years or longer. Instrumental climate and hydrological records for the past 100 years and tree-ring based data for the past 500 years indicate that multiyear perfect droughts simultaneously affecting Southern California, the Sierra-Sacramento system, and the Colorado River have occurred typically once or twice each century. Such 'perfect drought' episodes should be considered a normal part of the long-term climatic regime in California and Kings County.

Earthquake

Hazard Description

An earthquake is caused by a sudden slip on a fault. Stresses in the earth's outer layer push the sides of the fault together. Stress builds up and the rocks slip suddenly, releasing energy in waves that travel through the earth's crust and cause the shaking that is felt during an earthquake. The amount of energy released during an earthquake is usually expressed as a magnitude and is measured directly from the earthquake as recorded on seismographs. The magnitude of earthquakes is usually measured using the Richter scale, a logarithmic scale calculated from the amplitude of the largest seismic wave recorded for the earthquake.

Another measure of earthquake severity is intensity. Intensity is an expression of the amount of shaking at any given location on the ground surface. Seismic shaking is typically the greatest cause of damage to structures during earthquakes. Seismologists have developed the Mercalli scale to quantify the shaking intensity of an earthquake's effects, which is measured by how an earthquake is felt by humans and the damage to buildings.

Earthquakes can cause structural damage, injury, and loss of life, as well as damage to infrastructure networks such as water, power, gas, communication, and transportation lines. Other damage-causing effects of earthquakes are surface rupture, fissuring, settlement, and permanent horizontal and vertical shifting of the ground. Secondary impacts can include landslides, seiches, liquefaction, and dam failure.

In populated areas, the greatest potential for loss of life and property damage can come as a result of ground shaking from a nearby earthquake. The degree of damage depends on many interrelated factors. Among these are the Richter magnitude, focal depth, distance from the causative fault, duration of shaking, type of surface deposits or bedrock, presence of high ground water, topography, and finally, the design, type, and quality of building construction.

Geographic Extent and Potential Magnitude

No major fault systems are known to exist in Kings County, so the potential for extensive surface rupture is minimal. Minor surface rupture could occur in areas of minor faulting, which occur primarily in the southwestern part of the county along the Kettleman Hills. Ground shaking is the most likely damaging effect of an earthquake. The HMPC reported that shaking was felt during the Coalinga earthquake of magnitude (M) 6.4 in 1983. The epicenter of the Coalinga earthquake was located approximately 20 miles from the county's western border.

The San Andreas fault is located less than four miles west of the Kings County line. The San Andreas occurs where the North American and Pacific plates come together and grind in a side by side motion relative to each other. Another large known fault, the White Wolf fault, is located to the south near Arvin and Bakersfield and produced a severe M 7.7 earthquake in 1952. Figure 3.2 on the following page shows the known faults, historic epicenters, and potential for ground shaking resulting from earthquakes in and near Kings County.

The potential for ground shaking is discussed in terms of the percent probability of exceeding peak ground acceleration (% g) in the next 50 years. It varies from 20-30% g in the northeast third of the county, including the cities of Hanford, Lemoore, Corcoran, and the Santa Rosa Rancheria to 30-40% g in the central part of the county, which is primarily agricultural. Earthquake hazard is more severe in the southwest third of the county and the city of Avenal. The potential for ground shaking in this area ranges from 40-50% g to 70-80% g at the southwestern county line.

Earthquakes can occur at any time of the day or night and any time of the year. Earthquakes are particularly dangerous due to their rapid onset, generally without warning. Aftershocks can occur for days, weeks, and even months following a major earthquake. This additional damage to structures already weakened by the main earthquake increases the danger to rescue and recovery personnel.

Earthquakes can result in many secondary effects, including fires and landslides, which are covered in separate sections of this plan. Ground settlement and soil compaction also may occur as a result of seismic ground shaking. When unconsolidated valley sediments are saturated with water, water from voids is forced to the ground surface, where it emerges in the form of mud spouts or sand boils. If soil liquefies in this manner (liquefaction), it loses its supporting capacity, which can result in the minor displacement to total collapse of structures.

These types of unconsolidated sediments represent the poorest kind of soil condition for resisting seismic shock waves. Most of Kings County east of Interstate 5 and west of the railroad are mapped as having liquefaction potential in the Five-County Seismic Safety Element referenced in the Kings County General Plan (1994). This potential is recognized throughout the San Joaquin Valley where unconsolidated sediments and a high water table coincide (Kings County Emergency Operations Plan 2002).

Previous Occurrences

There have not been any damaging earthquakes greater than M 6.0 recorded in Kings County in over 200 years, though several have been very close. The most recent large earthquake near Kings County was the Kettleman Hills earthquake of magnitude 6.1 on August 4, 1985, whose epicenter was located four miles from the Kings County border just north of Avenal. This earthquake was the third in a sequence of moderate earthquakes that occurred along a shallowly dipping thrust fault on the eastern border of the San Joaquin Basin. It was preceded by two earthquakes located approximately 20 miles from Kings County, the 1982 New Idria earthquake (M 5.4) and the 1983 Coalinga (M 6.5). The Kettleman Hills earthquake did not result in any surface rupture. There was a low level of ground shaking and low local magnitude reported (Ekstrom and et al. 1992).

Major earthquakes have occurred near Kings County and resulted in ground shaking felt in the county. Figure 4.2 shows the historic epicenters of earthquakes in California from 1800-2000. The Fort Tejon earthquake in 1857 of M 7.9 was one of the greatest earthquakes ever recorded in the United States and the largest in California. It left an amazing surface rupture scar over 215 miles in length along the San Andreas fault. The epicenter is now thought to have been located near Cholame, approximately 34 miles northwest of the Kings County border near

Avenal. During the Fort Tejon earthquake, strong shaking lasted from one to three minutes. As a result of the shaking, the current of the Kern River was turned upstream, and water ran four feet deep over its banks. The waters of Tulare Lake were thrown upon its shores, stranding fish miles from the original lake bed. Property loss was heavy at Fort Tejon, one of the only settlements at the time, an Army post in southcentral Kern County about four miles from the San Andreas fault. In 1857, two buildings were declared unsafe, three others were damaged extensively but were habitable, and still others sustained moderate damage. One person was killed in the collapse of an adobe house at Gorman.

Probability of Future Occurrences

Research coordinated by the Southern California Earthquake Center in 1995 concluded that there is an 80 to 90 percent probability that an earthquake of M 7.0 or greater will hit Southern California along the San Andreas fault before 2024 (CA-SHMP 2004). Earthquake recurrence on the southern San Andreas fault varies greatly from under 20 years at Parkfield to more than 200 years in other sections.

Along the San Andreas fault, segments exist where no large earthquakes have occurred for long intervals of time. These areas accumulate potential energy and provide clues as to where the next earthquake may occur and when. Scientists term these segments "seismic gaps" and, in general, have been successful in forecasting the time when some of the seismic gaps will produce large earthquakes. Geologic studies show that over the past 1,400 to 1,500 years, large earthquakes have occurred at about 150-year intervals on the southern San Andreas fault. As the last large earthquake on the southern San Andreas was the Fort Tejon earthquake in 1857, that section of the fault is considered a likely location for an earthquake within the next few decades (USGS 1997).

Based on the earthquake shaking potential mapped for Kings County, the proximity to the San Andreas fault, and the history of shaking but no surface rupture, the probability of damaging seismic ground shaking in Kings County is **occasional**.

Extreme Heat

Hazard Description

Extreme temperature events, both hot and cold, can have severe impacts on human health and mortality, natural ecosystems, agriculture, and other economic sectors. According to information provided by the FEMA web site, 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.

The National Weather Service has a system in place to initiate alert procedures (advisories or warnings) when the Heat Index (HI) is expected to have a significant impact on public safety. The expected severity of the heat determines whether advisories or warnings are issued. A common guideline for the issuance of excessive heat alerts is when the maximum daytime HI is expected to equal or exceed 105°F and the night time minimum HI is 80°F or above for two or more consecutive days.

Extreme heat is largely a public health issue and a livestock issue in agricultural counties such as Kings County. In a normal year, about 175 Americans are killed by summer heat. According to the National Weather Service, among natural hazards, only the cold of winter—not lightning, hurricanes, tornadoes, floods, or earthquakes—takes a greater toll. The elderly, small children, chronic invalids, those on certain medications or drugs, and individuals with weight and alcohol problems are particularly susceptible to heat reactions, especially during heat waves in areas where moderate climates usually prevail. In agricultural areas, the exposure of farm workers to extreme temperatures is a major concern. Death of livestock is also a concern.

Geographic Extent and Potential Magnitude

The climate in Kings County is hot and arid, and the entire county is susceptible to extreme heat. The agriculturally-dominated central region of the county is likely to experience the greatest impacts from large or unseasonable temperature variations. Figures 3.4 and 3.5 show average and extreme temperatures at the Hanford weather station in the northeastern part of the county (1927-2005) and the Kettleman City weather station in the southwestern part of the county (1955-2005). At both stations, the highest temperature on record is 116°F. The average high is 95°F in Hanford in the summer and 97°F in Kettleman City. On average, there are 103 days over 90°F in the summer in Hanford and 114 days per year over 90°F in Kettleman City. The hottest months are July and August. At both stations, temperatures of 101°F or above are on record for every month May through October.

In Kings County, the agricultural industry is most at risk to extreme temperatures. Hot and cold temperature extremes damage crops, affecting the economy and potentially resulting in lost farming jobs. Field workers are susceptible to heat exhaustion and heat stroke. Elderly residents who may live alone and are limited in their mobility are also vulnerable during heat waves.

Problems with power loss and water distribution also occur during periods of extreme heat. Power outages and rolling brownouts can result when high temperatures increase air conditioner use. Power outages can prevent water pumping stations from operating.

Previous Occurrences

The SHEL DUS database lists two incidents of extreme heat in Kings County from 1960-2005. These occurred in June 1961, with \$14,700 in crop damages reported, and in September 1998. No damages are known for the 1998 event. During 2005-2006, Kings County received USDA emergency designations twice for heat waves.

Figure 3.4: Daily Temperature Averages and Extremes, Hanford

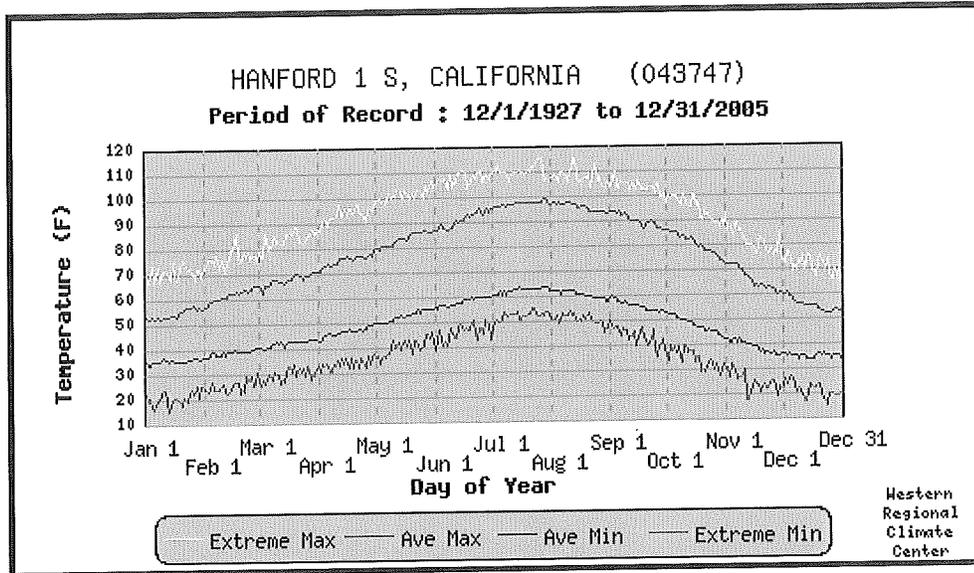
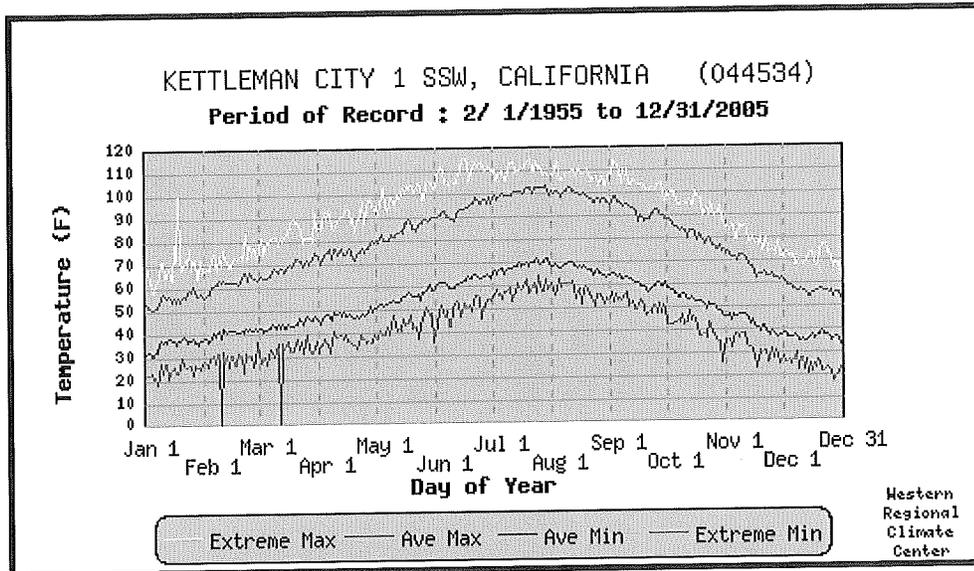


Figure 3.5: Daily Temperature Averages and Extremes, Kettleman City



Legend for Figures 3.4 and 3.5

Extreme Max is the maximum of all daily maximum temperatures recorded for the day of the year.
 Ave Max is the average of all daily maximum temperatures recorded for the day of the year.
 Ave Min is the average of all daily minimum temperatures recorded for the day of the year.
 Extreme Min is the minimum of all daily minimum temperatures recorded for the day of the year.

Source: Western Regional Climate Center, 2006, www.wrcc.dri.edu/CLIMATEDATA.html.

Probability of Future Occurrences

Temperatures at or above 95°F are common most summer days throughout Kings County, and it is **highly likely** that extreme heat will continue to occur on an annual basis in the future.

Flood

Hazard Description

The primary types of flood events in Kings County are riverine and urban. Flooding could also occur as a result of dam failure. Regardless of the type of flood, the cause is often the result of severe weather and excessive rainfall, either in the flood area, upstream, or from winter snowmelt.

Riverine flooding is the most common type of flood event and occurs when a watercourse exceeds its "bank-full" capacity. Riverine flooding generally occurs as a result of prolonged rainfall, or rainfall that is combined with already saturated soils from previous rain events. The duration of riverine floods may vary from a few hours (flash flood) to many days (slow-rise flooding). 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 the water resistance of the surface due to urbanization. The warning time associated with slow-rise floods assists with life and property protection.

As the slope of the river flattens, the velocity slows and the material is deposited. As a result, the lower reaches of many streams pass through the sandy alluvial plains that they have formed (CA-SHMP 2004). Flood flows can cause these streams to migrate, resulting in a higher and wider floodplain. Developed areas on land originally outside the defined floodplain can later flood.

The area adjacent to a river 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 that area that is inundated by the 100-year flood, the flood that has a one percent 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).

Urban flooding can occur in any terrain. It is particularly aggravated where natural cover has been removed to construct buildings, roads, and parking lots. Streets become rivers, inundating vehicles and causing damage to residential and industrial properties situated along stream channels (CA-SHMP 2004).

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

combination of the following causes: prolonged periods of rainfall and flooding resulting in excess overtopping flows, earthquake, improper design and/or maintenance, inadequate spillway capacity, internal erosion, or failure of upstream dams.

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

The potential for flooding can change and increase through various land use changes and changes to land surface, which result in changes to the floodplain. Environmental changes can create localized flooding problems in and outside of natural floodplains by altering or confining natural drainage channels. These changes are most often created by human activity.

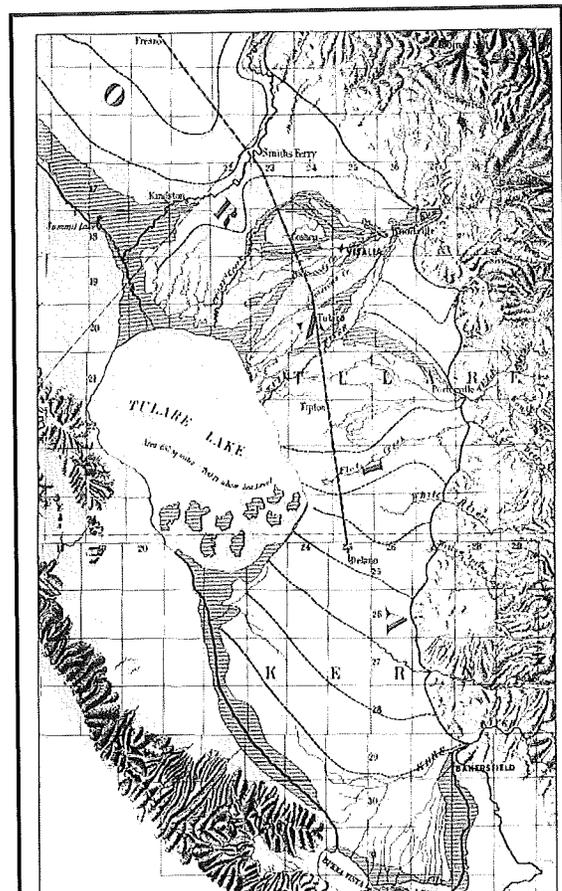
Figure 3.6: Tulare Lake and the San Joaquin Valley, 1870s

Geographic Extent and Potential Magnitude

FEMA's Flood Insurance Study for Kings County (1988) categorizes flooding in the county as sheetflow and ponding to shallow depths with low velocities and deposition of sand, silt, and debris on the flooded areas. Flooding occurs primarily from winter rain storms and snow runoff. The average flooding season in Kings County occurs from November through June with the rainy season occurring between November and April and snowmelt in the nearby mountainous area occurring from April to June.

California is divided into 10 hydrologic regions, and Kings County is in the Tulare Lake hydrologic region that comprises the extreme southern portion of the Central Valley. It is defined by the Sierra Nevada Mountains, the divide between the San Joaquin and Kings rivers, the Coast Range, and the Tehachapi Mountains (CA-SHMP 2004). Rivers in this region include the Kings, Kaweah, Tule, and Kern, which all historically drained into the Tulare Lake.

Through the late 1800s, Tulare Lake fluctuated but was of substantial size during wet periods. In 1849, the lake measured 570 square miles. Its size fluctuated from year to year due to varying



Tulare Lake and the southern San Joaquin Valley in the early 1870s. At the onset of American settlement in the area in the late 1840s, the lake was the largest body of fresh water west of the Great Lakes. Its destruction by the late 1800s because of diking and water diversion for irrigation was one of the most dramatic signs of a major theme in the state's history: the rapid transformation of the wild California landscape into one dominated almost completely by human action. From *Report of the Board of Commissioners on the Irrigation of the San Joaquin, Tulare, and Sacramento Valleys of the State of California* (Washington: Government Printing Office, 1874). Courtesy Huntington Library.

levels of rainfall and snowfall, but it ranked as the largest freshwater lake west of the Great Lakes. A number of small reclamation districts were established in the area in the early 1900s that over time built levees and reclaimed the more than 200,000-acre lakebed for agriculture. The Kaweah, Kern, Kings and Tule rivers were diverted upstream and canals were built to drain the lake. By the end of the nineteenth century the lake had almost completely disappeared. Aggressive groundwater pumping since the draining of the lake has resulted in a significant lowering of the water table, causing subsidence of the land. Because the lake's basin remains, the lake occasionally reappears during floods following unusually high levels of precipitation, as it did in 1997 and 2005. The entire county is criss-crossed by a large number of irrigation canals and ditches operated by several different irrigation districts and companies.

FEMA has assessed flood hazards for major streams in Kings County; these areas are shown in Figure 3.7 on the following page. Winter rainfall directly affects flooding in Cross Creek and the Tule River. Snowmelt flooding in the spring often causes the Tulare Lakebed to flood, affecting Cross Creek and the Tule River indirectly. The flood hazards in each jurisdiction are discussed in more detail in the jurisdictional annexes to this plan.

Figure 3.7 Kings County Flood Hazards

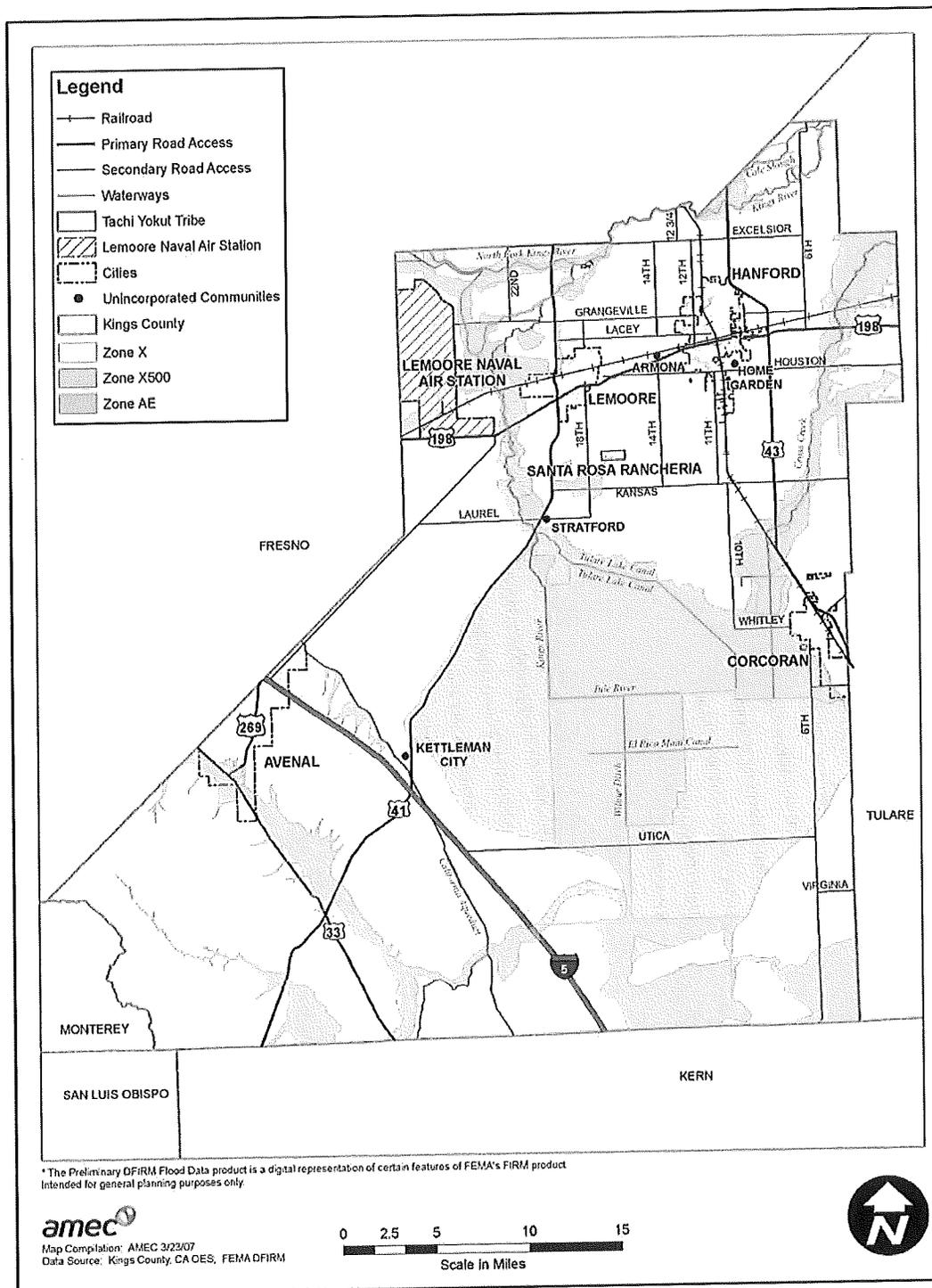
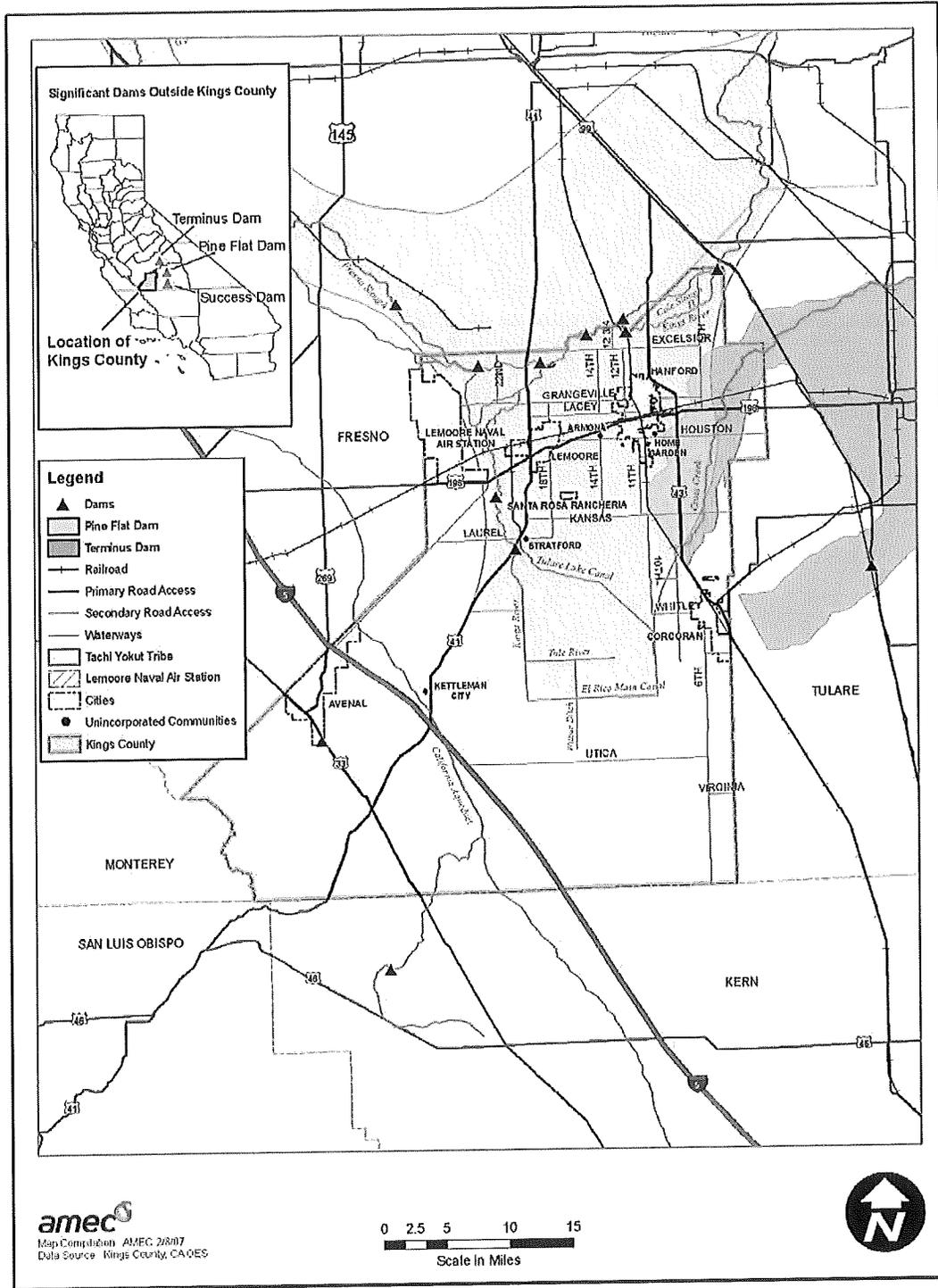


Figure 3.8 Kings County Dam Inundations



The Terminus, Success, and Pine Flat dams, located in the Sierra Nevada east of the valley floor on the Kaweah, Tule, and Kings Rivers respectively, in addition to improvements made to other flood control facilities in the Kings County area, have significantly reduced local natural flood hazards. Significant dams near and in Kings County are shown in Figure 3.8 on the previous page. According to the U.S. Army Corps of Engineers inundation maps, the failure of Success Dam would not affect inhabited portions of Kings County. Pine Flat and Terminus are the only dams in the region which, if breached, might cause flooding of significance to local inhabited areas (Kings County EOP 2002). The mapped inundation area for the failure of Terminus Dam covers the area east of Hanford and the railroad, and north of Corcoran to the eastern county line. The inundation area for the failure of Pine Flat Dam is much larger, covering the northern third of the county, east of the Lemoore Naval Air Station and west of Corcoran, south to the El Rico Main Canal. Controlled releases sometimes result in localized flooding or complete inundation of flood-prone areas within Kings County. Severe weather, unexpected runoff, or mechanical malfunctions may generate these releases (Kings County EOP 2002).

Previous Occurrences

Between 1992 and 2002, every county in California was declared a federal disaster area at least once for a flooding event. California has a chronic and destructive flood history. Half of the 72 federally declared disasters in California between 1950 and 2000 were flood related. Historically, floods have been the most frequent cause of disaster in Kings County. The primary cause of local flooding is the drainage pattern in the Tulare Lake Basin. This area has no outlet to the ocean unless the water is pumped by artificial means out of the Tulare Lake Basin (Kings County EOP 2002).

Significant flooding occurs in Kings County approximately every five years. Kings County was declared a storm disaster area by the federal government seven times between 1955 and 2002. FEMA's Flood Insurance Study listed flooding events in 1950, 1952, 1955, 1958, 1962, 1963, 1966, 1967, 1969, 1970, 1971, 1973, 1978, 1980, 1982, 1985, and 1986. Heavy snow runoff caused flooding in Kings County in January of 1969. Kings was the only county designated in this federal disaster declaration. Damage included \$1.56 million in public costs and \$1.25 million in private costs for a total of \$2.81 million.

Probability of Future Occurrences

Due to the history of past flooding events and the natural drainage pattern of the planning area, flooding in the Tulare Lake Basin is **likely** to continue to occur. There is no evidence to indicate that flooding due to dam failure is likely.

Fog

Hazard Description

Fog results from air being cooled to the point where it can no longer hold all of the water vapor it contains. For example, rain can cool and moisten the air near the surface until fog forms. A cloud-free, humid air mass at night can lead to fog formation, where land and water surfaces

that have warmed up during the summer are still evaporating water into the atmosphere. This is called radiation fog. A warm moist air mass blowing over a cold surface also can cause fog to form, which is called advection fog. The interior California valleys have a unique fog problem called the tule fogs. Tule fogs are "radiated" out of the ground and can develop into several layers of fog that can be thousands of feet thick. The fog develops in the San Joaquin Valley when calm, stable air conditions combine with moisture in the ground and a chilling factor. The tule fogs get their name from the tule reeds, which grew around the swamps and deltas of the great Tulare Lake that once covered the southern end of the San Joaquin Valley.

Geographic Extent and Potential Magnitude

The tule fog season in Kings County is typically December through February. Fog typically forms rapidly in the early morning hours. Tule fogs can last for days, sometimes weeks. Fog can have devastating effects on transportation corridors in the county. Night time driving in the fog is dangerous and multi-car pileups have resulted from drivers using excessive speed for the conditions and visibility.

Fog contributes to transportation accidents and is a significant life safety hazard. These accidents can cause multiple injuries and deaths and could have serious implications for human health and the environment if a hazardous or nuclear waste shipment were involved. Other disruptions from fog include delayed emergency response vehicles and school closures.

Previous Occurrences

Between 1962 and 2003, the SHELDUS database recorded 13 incidents of damaging fog, responsible for 4 deaths, 23 injuries, and approximately \$200,000 in property damage. Most damages are a result of automobile accidents. All incidents occurred between the months of November and February.

Probability of Future Occurrences

Fog occurs every year in Kings County, and damaging fog events have occurred every three years on average since 1962. Probability is **highly likely** that fog will occur on an annual basis and that damaging fog events will continue to occur every few years.

Freeze

Hazard Description

Unseasonable cold temperatures can have large impacts on crops in Kings County. The growing season is approximately 257 days per year, and the frost-free period usually extends from mid-February to mid-November. The mean frost-free period in the western part of the county is 225-250 days.

Geographic Extent and Potential Magnitude

The entire county is susceptible to extreme temperatures. Agricultural areas throughout the central part of the county are likely to experience the greatest impacts from large or

unseasonable temperature variations. Figures 3.4 and 3.5 in the Extreme Heat section show daily temperature averages and extremes from the Hanford and Kettleman City weather stations. At the Hanford station, the minimum daily temperature reaches 32°F or less an average of 35 days of the year. At the Kettleman City station, temperatures reach 32°F or less an average of 11 days a year. The recorded high daily temperature has always been greater than 32°F. The lowest daily temperature recorded is 15°F in Hanford and 20°F in Kettleman City.

Average annual snowfall at both Hanford and Kettleman City is zero. The maximum amount of snowfall recorded was two inches in Hanford, which occurred in January 1962; there has not been any measurable snowfall recorded since then. There is no recorded snowfall in Kettleman City.

Prolonged freezing temperatures can damage or destroy crops, affecting the economy and agricultural jobs in Kings County. Water infrastructure is also at risk from freezing, including line breaks and frozen valve gates affecting the distribution system.

Previous Occurrences

The SHELDUS database records six incidents of freezes and severe cold between 1970 and 2005. No injuries or deaths are recorded but millions of dollars in crop damage occurred. There have been two state emergency declarations, in 1972 and 1999, for freezes in Kings County. The 1972 freeze resulted in \$113.5 million in crop damages in 17 designated counties.

In 1999, a state emergency was declared for a severe freeze event that occurred December 20-28, 1998. During this time period, California's San Joaquin Valley farming communities were hit with freezing temperatures that severely affected the region's crops and resulted in a Presidential disaster declaration. The declaration made federal funds available to supplement unemployment compensation for farm laborers and other farm industry workers put out of work as a direct result of lost citrus and seasonal crops in Fresno, Kern, Kings, Madera, Monterey, and Tulare counties. FEMA provided \$6.9 million for mortgage and rental assistance to over 6,000 individuals across the six-county disaster area.

An extended period of extreme cold hit Kings County in January of 2007, causing a state of emergency declaration (CDAA 2007-02) from the governor and a federal disaster declaration (DR1689) in March 2007. The event caused replanting costs (losses) of \$91,387 in the county.

Probability of Future Occurrences

In the past, severe freezes have occurred every few years. Seven damaging freezes are recorded for the last 36 years, which is an average of once every five years or a probability of 19 percent in any given year. Therefore, the probability of future occurrence is **likely**.

Landslide

Hazard Description

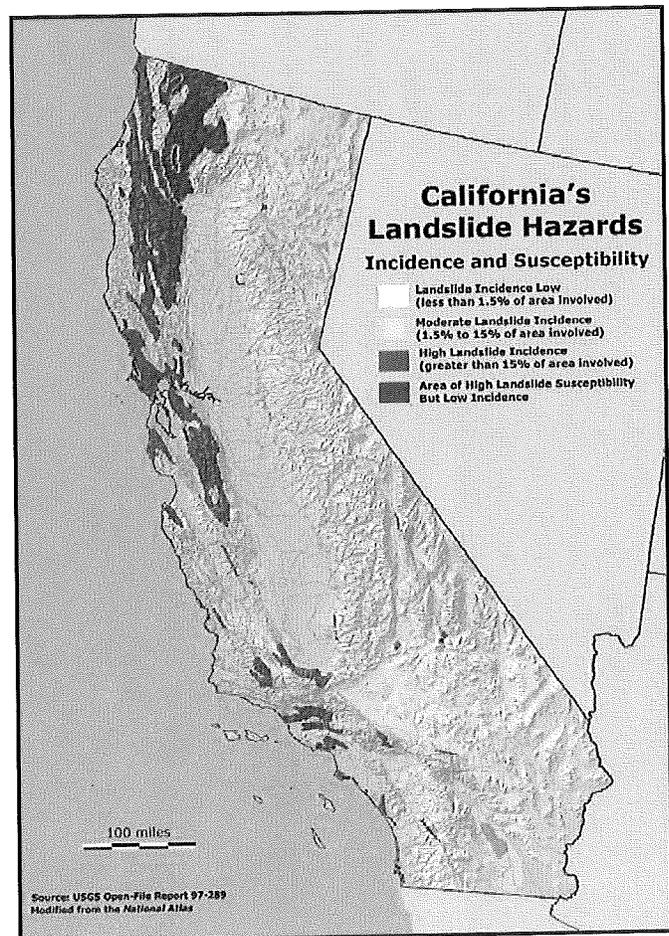
Landslides can refer to a wide variety of processes that result in the perceptible downward and outward movement of soil, rock, and vegetation under gravitational influence. Common names for landslide types include slump, rockslide, debris slide, lateral spreading, debris avalanche, earth flow, and soil creep. Although landslides are primarily associated with steep slopes (i.e., greater than 15 percent), they may also occur in areas of generally low relief and occur as cut-and-fill failures, river bluff failures, lateral spreading landslides, collapse of mine-waste piles, and failures associated with quarries and open-pit mines. Debris flows are another type of landslide, which generally occur in the immediate vicinity of existing drainage swales or steep ravines. Debris flows occur when near-surface soil in or near steeply sloping drainage swales becomes saturated during unusually heavy precipitation and begins to flow downslope at a rapid rate.

Landslides may be triggered by both natural and human-induced changes in the environment resulting in slope instability. Precipitation, topography, and geology affect landslides and debris flows. Human activities, such as mining, road construction, and changes to surface drainage areas, also affect the landslide potential. Landslides often accompany other natural hazard events, such as floods, wildfires, or earthquakes. Landslides can occur slowly or very suddenly and can damage and destroy structures, roads, utilities, and forested areas and cause injuries and death.

Geographic Extent and Potential Magnitude

The California Geological Survey does not have a landslide risk map prepared for Kings County, so the USGS national-scale map was used to identify possible landslide problem areas. The map in Figure 3.9 depicts where large numbers of landslides have occurred and areas that are susceptible to landslides. Landslide incidence is mapped as low (less than 1.5 percent of area involved) throughout Kings County. The data for this map is highly generalized and was

Figure 3.9: California Landslide Hazards



Source: USGS Open File Report 97-289

developed at a scale unsuitable for local planning or site selection.

Landslide hazards are uncommon through much of county due to the flat topography. Risk is greater in the southwestern part of the county, including the Kettleman Hills, due to the more varied elevations and steeper slopes.

Winter and spring are typically the landslide/rockfall seasons in California as rain falls and snow melts and saturates soils and temperatures enter into freeze/thaw cycles. Debris and mud flows generally occur during summer cloudbursts. Debris and mud slides and rockfall can occur rapidly with little warning during torrential rains. Landslides typically have a slower onset and can be predicted to some extent by monitoring soil moisture levels and ground cracking or slumping in areas of previous landslide activity.

Previous Occurrences

The HMPC noted that in the past, landslides have occurred in the western part of the county, particularly in burn areas and after heavy rains. Heavy rain events caused a slope failure around a water line for Avenal in 1995 and 1998. More information on this event is provided Avenal's annex to the plan.

Probability of Future Occurrences

There is limited data on past events, but **occasional** landslides and debris flows are likely to occur in the western part of to the county in the future.

Tornado

Hazard Description

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 miles per hour (mph). They usually accompany a thunderstorm. Tornado magnitude is ranked according to the Enhanced Fujita scale listed below:

Enhanced Fujita Tornado Scale

- EF0: 65-85 mph
- EF1: 86-110 mph
- EF2: 111-135 mph
- EF3: 136-165 mph
- EF4: 166-200 mph
- EF5: Over 200 mph

Geographic Extent and Potential Magnitude

Based on the NCDC data and tornado behavior, tornadoes are more likely to hit the flatter, lower elevations of Kings County and are more common in the eastern parts of the county around Hanford, Lemoore, and Corcoran. Tornadoes develop rapidly and can occur without warning. The National Weather Service can predict the weather patterns that produce tornadoes and issue tornado warnings or watches when warranted. Most tornadoes last less than 10 minutes, though some have been observed to last an hour. Tornadoes in California are rarely severe, however, even small tornadoes can be damaging if they hit a populated area. Because the likelihood is small and the duration typically short, the expected average damage from a tornado in Kings County is considered to be slight.

Previous Occurrences

The NCDC and the SHELDUS databases report six occurrences of tornados and several funnel clouds on record between 1960 and 2005 in Kings County. All of these events occurred during fall and spring between October and April. Most of the tornados were ranked as F0 on the Fujita Scale and did not result in property damage. However, on November 22, 1996, a F1 tornado caused about \$250,000 in damage at the Lemoore Naval Station. Damage included roof removal of the base recycling center, and wind damage to several administrative structures, power lines and poles, and fixed structures (NCDC 2006). Table 3.6 lists recorded tornado events for Kings County.

Table 3.6: Recorded Tornadoes in Kings County, 1950-2006

Location	Date	Magnitude	Deaths/Injuries	Property Damage	Crop Damage
Kings	11/01/1964	F0	0/0	0	0
Kings	04/05/1980	F2	0/1	\$250,000	0
Kings	10/12/1991	F0	0/0	0	0
Lemoore	03/05/1994	F0	0/0	0	0
Hanford	03/12/1996	F0	0/0	\$10,000	0
Lemoore Naval Air Station	11/12/1996	F1	0/0	\$250,000	0

Source: National Climatic Data Center, 2006.

Probability of Future Occurrences

When compared to other states by the frequency per square mile, California ranks 44th for the frequency of tornadoes and for injuries per area and ranks 40th for costs per area (CA-SHMP 2004). During the 56 years of record, 6 days of tornadoes have been recorded in Kings County, or one tornado every 7 years on average. This equates to an annual chance of occurrence of about 11 percent. There are no official recurrence intervals calculated for tornadoes. However, if one assumes a tornado affects only one square mile and there are 1,435 square miles in Kings County, the annual probability of a tornado hitting any particular square mile in the planning area is .107 in 1,435 or a 0.007 percent chance. Probability is **occasional**.

Wildfire

Hazard Description

Fire conditions arise from a combination of hot weather, an accumulation of vegetation, and low moisture content in the air. These conditions, when combined with high winds and periods of drought, increase the potential for wildfire. Fires also occur in areas where development has expanded into rural areas. In this wildland-urban interface, fires can result in major losses of property and structures. Generally, there are three major factors that sustain wildfires and are used to predict a given area's potential to burn: fuel, topography, and weather.

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 needles and leaves, twigs, and branches to standing dead trees, live trees, brush, and cured grasses. Manmade structures and other associated combustibles are also fuel sources. The type of prevalent fuel directly influences the behavior of wildfire. Light fuels, such as grasses, burn quickly and serve as a catalyst for fire spread. The volume of available fuel is described in terms of fuel loading.

Topography affects an area's susceptibility to wildfire spread. Fire intensities and rates of spread increase as slope increases due to the tendency of heat from a fire to rise via convection. The natural arrangement of vegetation throughout a hillside can also contribute to increased fire activity on slopes. Topography also affects the ability of response crews and vehicles to reach fires in a timely manner due to steep and winding roads.

Weather components, such as temperature, relative humidity, wind, and lightning, also affect the potential for wildfire. High temperatures and low relative humidity dry out the fuels that feed the wildfire creating a situation where fuel will more readily ignite and burn more intensely. Wind is the most treacherous weather factor. The greater wind speed, the faster a fire will spread, and the more intense it will be. In addition to high winds, wind shifts can occur suddenly due to temperature changes or the interaction of wind with topographical features, such as slopes or steep hillsides. Related to weather is the issue of recent drought conditions contributing to concerns about wildfire vulnerability. During periods of drought, the threat of wildfire increases.

Geographic Extent and Potential Magnitude

In most of Kings County, the California Department of Forestry and Fire Protection (CDF) ranks fuel loading as low. Fuels are mainly crops and grasses. In the southwest corner, there are some brush, pine, and grass fuels, which are ranked as moderate fuel hazards, primarily in the area west of Interstate 5 and north of Highway 41. See Figure 3.10: Kings County Wildfire Hazards. Vacant parcels where dry weeds are permitted to accumulate are a fire hazard, but grain crops, such as oats and barley, are also at high risk since they are harvested in a dry state during the peak fire season. Crop fires account for most of the annual dollar loss in Kings County due to wildland fires (Kings County EOP 2002).

Most of Kings County is flat, sloping slightly towards a topographic low point in the Tulare Lake Basin, which reduces the fire hazard through much of the county. However, elevations in the

southwestern portion of the county are more varied, ranging from 500 feet at the Kettleman Plains to an elevation of 3,499 feet at Table Mountain. Fire hazard is high in the more steeply sloped areas of this southwestern section.

The California Fire Plan analysis of the frequency of severe fire weather has not been completed for the Fresno-Kings Unit of CDF. Generally, fire season in Kings County extends from early spring to late fall. Onset can happen suddenly due to lightning or human causes and wildfires can last from a few hours to a few months. Secondary effects from wildfire include increased erosion, degraded air and water quality, and economic impacts from burned landscapes.

The wildfire threat map, Figure 3.10, shows the fire threat rating for Kings County. The potential wildfire threat was analyzed using GIS data developed by the CDF (2003 edition 03_1 with 100-meter cell size). CDF calculated a numerical index of fire threat based on the combination of fuel rank and fire rotation. This threat index was then grouped into five threat classes: extreme, very high, high, moderate, and little or no threat. CDF buffered the threat categories with a 2,400-meter buffer (approximately 1.5 miles) to identify areas that include or are near very high threat areas. Each class was buffered independently and then overlaid in the following priority: extreme, very high, high, moderate, little or no threat. Thus, areas of greater threat class take precedence over areas with lesser or no threat class.

The map indicates that areas of moderate to high hazard occur in the northeast corner of the county around urbanized areas. The central, primarily agricultural areas, and the old Tulare Lakebed have little to no threat. Most of the high threat area occurs west of Interstate 5 and very high threat areas are west of Highway 33. A very high fire threat area is mapped along the Fresno County boundary and in Avenal's city boundary along Highway 269.

Previous Occurrences

There have not been any state or federal disaster declarations in Kings County related to wildfire in the past. The HMPC noted that although there are many fire starts, the fuels are "flashy" and fires are usually quickly put out. Table 3.7 below shows historic fires mapped by CDF. Except for the Braley-Jones Ranch fire in 1951 near Stratford, all other mapped fires occurred west of Interstate 5. The largest was the Skyline fire in 1996, which burned over 20,000 acres along the west side of Interstate 5, north of Highway 41 and east of Avenal.

Table 3.7: Fire History in Kings County, 1950-2001

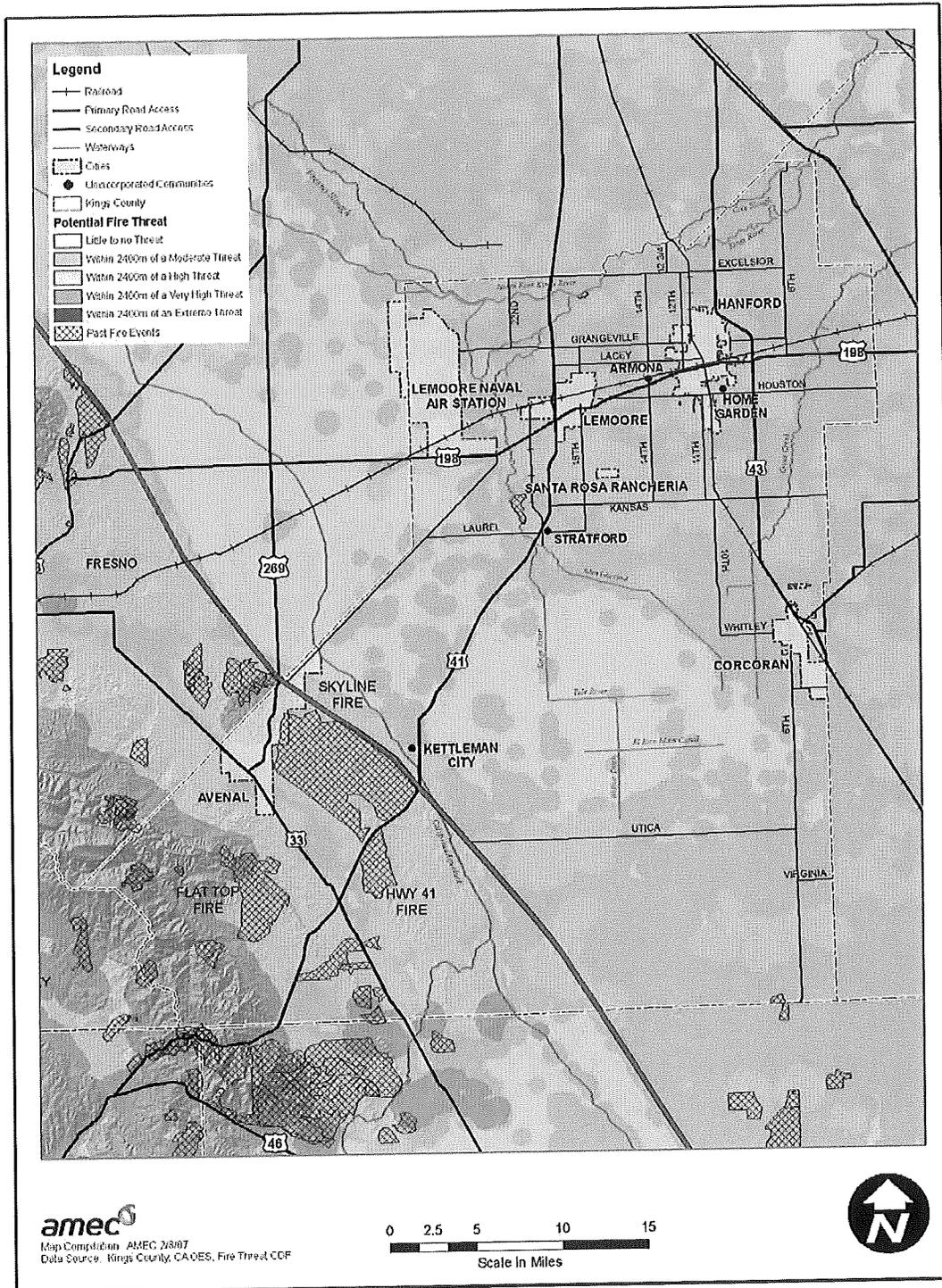
Date	Name of Fire	Acres Burned	Agency
06/04/1951	Braley-Jones Ranch	468	CDF
09/22/1968	Hughs	776	CDF
07/30/1969	Avenal Canyon	983	CDF
05/22/1979	Pyramid Hills	693	CDF
07/01/1979	State of California #32	2,292	CDF
05/25/1984	Flat Top	7,218	CDF
06/03/1989	Cal Oil	492	CDF
06/12/1994	York	1,012	CDF
09/04/1995	Tar	126	CDF
09/08/1995	Pyramid	397	CDF
04/27/1996	Skyline	20,567	BLM
05/01/1996	Hwy 41	3,198	BLM
08/13/1999	33	243	CDF
08/27/2001	Taylor	26	CDF

Source: CDF, year unknown.

Probability of Future Occurrences

Fire starts are highly likely during each fire season; though, they rarely result in large-scale wildfires. Fourteen historic fires are mapped for the last 56 years, which averages to one fire every four years, or a 25 percent chance of occurrence in any given year. Based on climate and weather in Kings County and the fuels, topography, and fire history in the southwestern part of the county, it is **likely** that fires will continue to occur in the future.

Figure 3.10: Kings County Wildfire Hazards



Hazard Profile Summary by Jurisdiction

The following tables summarize the data provided by the HMPC on the potential magnitude and the probability of occurrence for each of the identified hazards across the planning area.

Table 3.8: Probability of Occurrence for Identified Hazards in Kings County

Hazard	Kings County*	Avenal	Corcoran	Hanford	Lemoore
Dam Failure	Unlikely	Unlikely	Unlikely	Unlikely	Unlikely
Drought	Occasional	Occasional	Occasional	Occasional	Occasional
Earthquake	Occasional	Occasional	Occasional	Occasional	Occasional
Extreme Heat	Highly Likely				
Flood	Likely	Likely	Likely	Occasional	Occasional
Fog	Highly Likely				
Freeze	Likely	Occasional	Likely	Likely	Likely
Landslide	Occasional	Occasional	Unlikely	Unlikely	Unlikely
Tornado	Occasional	Unlikely	Occasional	Occasional	Occasional
Wildfire	Likely	Occasional	Unlikely	Unlikely	Unlikely

Source: Kings County Hazard Mitigation Planning Committee, 2007.

Table 3.9: Potential Magnitude of Identified Hazards in Kings County

Hazard	Kings County*	Avenal	Corcoran	Hanford	Lemoore
Dam Failure	Catastrophic	Negligible	Critical	Critical	Catastrophic
Drought	Critical-Catastrophic	Critical	Critical	Critical	Limited
Earthquake	Critical	Critical	Critical	Critical	Critical
Extreme Heat	Limited	Limited	Limited	Limited	Limited
Flood	Critical	Critical	Critical	Limited	Limited
Fog	Limited	Limited	Limited	Limited	Negligible
Freeze	Limited	Limited	Limited	Limited	Negligible
Landslide	Negligible	Critical	Negligible	Negligible	Negligible
Tornado	Negligible	Negligible	Limited	Limited	Limited
Wildfire	Critical	Limited	Negligible	Negligible	Negligible

Source: Kings County Hazard Mitigation Planning Committee, 2007.

3.3 VULNERABILITY ASSESSMENT

44 CFR Requirement §201.6(c)(2)(ii): The risk assessment shall include (A) The types and numbers of existing and future buildings, infrastructure, and critical facilities located in the identified hazard areas; (B) An estimate of the potential dollar losses to vulnerable structures...and a description of the methodology used to prepare the estimate; (C) A general description of land uses and development trends within the community so that mitigation options can be considered in future land use decisions.

Methodology

The vulnerability assessment further defines and quantifies populations, buildings, critical facilities, and other community assets at risk to natural hazards. The vulnerability assessment for this plan followed the methodology described in the FEMA 386-2, *Understanding Your Risks – Identifying Hazards and Estimating Losses* (2002) and addresses parts three and four, where data permits, of the following four-step risk assessment process:

- 1) Identify Hazards
- 2) Profile Hazard Events
- 3) Inventory Assets**
- 4) Estimate Losses**

The vulnerability assessment was conducted based on the best available data and the significance of the hazard. Data to support the vulnerability assessment was collected from the following sources:

- County and jurisdictional GIS data (hazards, base layers, and assessor's data)
- Statewide GIS datasets compiled by CA-OES to support mitigation planning
- FEMA's HAZUS loss estimation software
- Written descriptions of assets and risks provided by participating jurisdictions
- Existing plans and reports
- Personal interviews with HMPC members and other stakeholders

The vulnerability assessment first describes the assets at risk in Kings County, including the total exposure of people and property; critical facilities and infrastructure; natural, cultural, and historic resources; and economic assets. Secondly, the assessment considers the social vulnerability of the county to hazards, including characteristics of gender, age, race/ethnicity, and wealth and poverty. Next, hazards of high and medium significance are evaluated in great detail and potential losses are estimated where data is available. Development trends, including population growth, housing demand, and land use patterns, are analyzed in relation to hazard-prone areas. The end of the chapter summarizes the key issues and conclusions identified in the risk assessment process.

Assets at Risk

This section assesses the population, structures, critical facilities and infrastructure, and other important assets in Kings County at risk to natural hazards.

Total Exposure to Hazards

Table 3.10 shows the total population, number of structures, and assessed value of improvements to parcels by jurisdiction. Land values have been purposely excluded because land remains following disasters, and subsequent market devaluations are frequently short term and difficult to quantify. Additionally, state and federal disaster assistance programs generally do not address loss of land or its associated value.

The greatest exposure of people and property are concentrated in Hanford, though significant population and structures are spread out in the unincorporated areas of the county. The Lemoore Naval Air Station is not included in this data, because the station independently undertakes hazards mitigation and other emergency planning and did not participate in this planning process.

Table 3.10: Maximum Population and Building Exposure by Jurisdiction

Jurisdiction	Exposed Population	Buildings	
		Number	Value
Kings County*	35,496	9,707	\$1,028,530,819
Avenal	16,349	1,754	\$128,111,815
Corcoran	23,448	2,966	\$257,957,828
Hanford	49,048	14,080	\$1,991,860,304
Lemoore	23,388	5,913	\$853,282,697
Total	147,729	34,420	\$4,259,743,463

Source: California Department of Finance, May 2006 and Kings County Assessor, 2007. *Unincorporated areas.

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. 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 a third category of critical assets. Examples of each are provided on the following page.

- | | | |
|--|---|--|
| <p>Essential Facilities</p> <ul style="list-style-type: none"> • Hospitals and other medical facilities • Police stations • Fire station • Emergency Operations Centers | <p>High Potential Loss Facilities</p> <ul style="list-style-type: none"> • Power plants • Dams and levees • Military installations • Hazardous material sites • Schools • Shelters • Day care centers • Nursing homes • Main government buildings | <p>Transportation and Lifelines</p> <ul style="list-style-type: none"> • Highways, bridges, and tunnels • Railroads and facilities • Airports • Water treatment facilities • Natural gas and oil facilities and pipelines • Communications facilities |
|--|---|--|

Table 3.11 displays the inventory of available data on critical facilities in Kings County as provided by the HMPC and Kings County GIS data. Data generated by HAZUS did not appear accurate and is not included.

Table 3.11: Inventory of Critical Facilities by Jurisdiction

Facility	Kings County*	Avenal	Corcoran	Hanford	Lemoore	Total
Hospitals	1	0	1	2	0	4
Medical Centers		3	3	4	3	13
Schools	11	6	7	31	17	72
Fire Stations	6	1	1	3	2	13
Sheriff's Office/ Police Stations	3	0	1	1	1	3
Emergency Operations Centers	2	0	0	1	0	3
Power Facilities	17	1	1	1	1	21
Dams						6
Airports		1	1	1	0	3

Source: Kings County Hazard Mitigation Planning Committee, 2007. *Unincorporated areas.

Other facilities in the county, such as locations that hold musical concerts, sporting events, and other events that attract large numbers of people, may also be at higher risk due to concentrations of population. These include, but are not limited to, the Kings County Fairgrounds, the Palace Indian Gaming Center, Hanford Bowl, Hanford High School Presentation Center, high school campuses, and county or city parks (Kings County EOP 2002).

Other critical facilities unique to the county are the California Aqueduct, Kettleman Hills Hazardous Waste Facility, and the Lemoore Naval Air Station. These facilities are described further on the following page. The Corcoran and Avenal State Prisons are also considered

unique facilities; however, these facilities are better addressed in the emergency operations plans for the county and the two municipalities.

The **California Aqueduct**, part of the California State Water Project, runs through the western part of Kings County. The State Water Project is a water storage and delivery system of reservoirs, aqueducts, power plants, and pumping plants. Its main purpose is to store water and distribute it to 29 urban and agricultural water suppliers in Northern California, the San Francisco Bay Area, the San Joaquin Valley, the Central Coast, and Southern California. Seventy percent of the contracted water supply goes to urban users and thirty percent goes to agricultural users. The State Water Project makes deliveries to two-thirds of California's population. Earthquakes, landslides, flooding, or other hazard events that disrupt the aqueduct's ability to deliver water could have serious impacts to agriculture in the county and water users in many areas of California.

The **Kettleman Hills Hazardous Waste Facility** is a chemical waste disposal and treatment site with a capacity of 5,700,000 cubic yards, operated by Chemical Waste Management. The site is located four miles from Kettleman City and less than three miles west of Interstate 5. The 1,600-acre site employs 120 people and accepts waste from all over the western United States but primarily California. The facility is one of less than 30 commercial chemical waste sites in the country and one of less than 10 sites licensed to take polychlorinated biphenyls (PCBs).

The integrity of the hazardous waste site was breached in March 1988 when a landslide surged forward and downslope, tearing out part of the liner system and displacing waste deposited at the site. The incident may have been caused by design defects of the facility; however, the incident indicates that the facility may be vulnerable to seismic hazards present in the Kettleman Hills area. In the past, the facility has been fined by the U.S. Environmental Protection Agency and the California Department of Health Services for allowing leaks to contaminate local groundwater (San Diego District Attorney 1992). Water contamination is a concern in a seismic event, as well.

The **Lemoore Naval Air Station** encompasses 4.2 square miles in Kings County and includes critical facilities, such as medical facilities and an airport. It is also one of the largest employers in the county, with 1,300 civilian employees. Although this plan recognizes the critical assets of the station and its role in the county's economy, as federally-owned property, the station develops separate emergency management plans.

Natural, Historical, and Cultural Assets

Assessing the vulnerability of Kings County 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.

- If these resources are impacted by a disaster, knowing so ahead of time allows for more prudent care in the immediate aftermath, when the potential for additional impacts are 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, such as wetlands and riparian habitat, which help absorb and attenuate floodwaters.

Natural Resources

Wetlands are a valuable natural resource for communities due to their benefits to water quality, wildlife protection, recreation, and education. From a hazards and mitigation perspective, wetlands provide drought relief in water-scarce areas where the relationship between water storage and streamflow regulation are vital. Wetlands reduce flood peaks and slowly release floodwaters to downstream areas. When surface runoff is dampened, the erosive powers of the water are greatly diminished. Furthermore, the reduction in the velocity of inflowing water as it passes through a wetland helps remove sediment being transported by the water.

According to the U.S. Fish and Wildlife Service National Wetland Inventory, a number of small wetlands and wetland systems are present around the edges of Hanford and Lemoore in all directions and north of the Corcoran. No wetlands are located in the vicinity of Avenal. These wetlands include freshwater ponds, freshwater emergent wetlands, and forested shrub/scrub wetlands. In addition, the Biological Resources Report for the Kings County General Plan Update (1993) found that the only known vernal pools in Kings County are located in the grasslands along Cross Creek, just west of Highway 99 and north of Highway 198. Other pools are thought to be present in the grasslands along Cottonwood Creek, north of Corcoran Irrigation District Reservoir, and in the valley sink scrub community west of Guernsey.

The California Department of Fish and Game Natural Diversity Database identifies three sensitive habitat types that occur in Kings County: valley sink scrub, valley saltbush scrub, and valley sacaton grassland. Brief descriptions of these three habitat types are listed below:

- Valley sink scrub occurs on heavy, saline and/or alkaline clays of lakebeds or playa. Iodine bush and other succulent perennials in this community require periodic flooding for reproduction. This scrub community includes some playas that are so highly alkaline that they are entirely devoid of vegetation. Characteristic species in this plant community are iodine bush, recurved larkspur, goldfields species, Nitrophila, alkali sacaton, and seepweed species. Valley sink scrub formerly surrounded Tulare Lake and other lakes in the Tulare Valley and extended north along the trough of the San Joaquin Valley through Merced County.
- Valley saltbush scrub is generally found in the southwestern San Joaquin Valley on dissected alluvial fans with flat to gently rolling relief. This community is dominated by gray-green or blue-green shrubs of the goosefoot family with a sparse understory of short, annual herbaceous vegetation.

- Valley sacaton grassland occurs in fine textured, poorly drained soils often with vernal pools and alkali meadows. This plant community was once extensive in the Tulare Lake Basin and along the San Joaquin Valley north to Stanislaus and Contra Costa counties.

An inventory of protected plants and animals occurring in Kings County was conducted using data from the U.S. Fish and Wildlife Service (Sacramento office) and the California Department of Fish and Game Natural Diversity Database, Rarefind Version 3.0. Information regarding the potential for particular species to occur in a particular city within the county was provided by the natural resource elements of the general plans of the respective cities and the Biological Resources Survey for the Resource Conservation Element Update of the Kings County General Plan (1993), the U.S. Fish and Wildlife Service, and *The Birds of Kings County* (2005). A summary of protected species is provided below; the complete list can be found in Appendix C.

Nine federally endangered and seven federally threatened species occur in the county, in addition to two state threatened and ten species of state concern. An endangered species is any species of fish, plant life, or wildlife, which is in danger of extinction throughout all or a significant part of its range and is protected by law. A threatened species is a species that is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range and is protected by law. Any future hazard mitigation projects are subject to these laws.

Natural resources are also 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. 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.

Historical and Cultural Resources

Several national and state historic inventories were reviewed to identify historic and cultural assets in Kings County. No sites in the county were found on the Historic American Building Survey List or in the National Historic Landmarks. Table 3.12 that follows shows the historic sites in Kings County listed in the databases of the National Register Inventory List, California State Historic Landmarks, *Historic Spots in California* (Hoover, M.B. et al. 2002), and the sites of local historic significance listed in the Kings County General Plan. Additional cultural resources in Kings County listed by the California Historical Society are the Fort Roosevelt Natural Science and History Museum and the Ruth and Sherman Lee Institute for Japanese Art in Hanford.

By definition, a historic property not only includes buildings or other types of structures, such as bridges and dams, but also includes prehistoric or Native American sites, roads, byways, historic landscapes, and many other features. Given the history of the county, these types of historic properties are likely to exist; however, there is not a current inventory associated with them.

Table 3.12: Historic Sites in Kings County

National Register of Historic Places	California State Historical Landmarks and <i>Historic Spots in California</i>	Kings County General Plan Sites of Local Historic Significance
Hanford Carnegie Library	Tulare Lake	Cavalry Cemetery
Kings County Courthouse	Cross Creek and Kingston Stage Stations	Corcoran Cemetery
Taoist Temple in Hanford's China Alley	El Adobe de los Robles Rancho	First High School
Witt Site in Kettleman City	Location of the famous mussel slough tragedy	Grangeville Cemetery
	Kingston	Indian Cemetery
	Avenal Ranch	Kettleman City Lakeshore Fossil Beds
	Adobe Trading Post on west shore of Tulare Lake	Kings River Church
	Lemoore old post office	Kings River Cemetery
	Mooney home in Lemoore	Kingston Town Site
	Hanford Veterans' Memorial Building	Lakeside Cemetery
	Roosevelt Elementary School in Hanford	Methodist Church of Grangeville
		Rhoads Cemetery
		Original site of Lemoore

Source: National Register of Historic Places (2006), California Historic Preservation Office (2004), Hoover, MB. et al (2002), and Kings County General Plan (1993).

It should be noted that as defined by the California Environmental Quality Act (CEQA) and 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, the property must be evaluated under the guidelines set forth by the CEQA and NEPA. Structural mitigation projects, such as earthquake retrofits, are included in this regulation.

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. After a disaster, economic vitality is the engine that drives recovery. Every community has a specific set of economic drivers, which are important to understand when planning ahead to reduce disaster impacts to the economy. When major employers are unable to return to normal operations, impacts ripple throughout the community. The table below shows the top 10 employers in Kings County.

Table 3.13: Top 10 Employers in Kings County

Employer	Number of Employees	Location
Corcoran State Prisons	3,500	Corcoran
Del Monte Foods	1,400	Hanford
Lemoore Naval Air Station	1,400 civilian	Lemoore
Avenal State Prison	1,300	Avenal
JG Boswell Company	1,200	Corcoran
Kings County	1,041	Hanford
Adventist Health	857	Hanford
Leprino Foods	618	Lemoore
Paramount Foods	600	Avenal
Marquez Brothers	306	Hanford
Reef-Sunset Unified School District	306	Avenal

Source: Kings County Economic Development Corporation, 2004.

Agriculture is the largest economic sector of Kings County. The gross value of all agricultural crops and products during 2005 was \$1,407,091,000, which is an increase of \$115,001,000 (8.9 percent) from 2004. The highest gain was in fruit and nut crops, which grew by 42 percent due to increased production coupled with increased acreage. The county's leading commodity remains milk with a value of \$455,897,000 in 2005. The total harvested crop acreage in 2005 was 800,293 out of 890,545 acres. 2006 values were not calculated at the time of this plan.

Agricultural losses resulting from natural hazards can have dramatic impacts on the economic health of Kings County. Past losses to agricultural commodities due to extreme weather have occurred at a rate of approximately one event per year since 1997, most often in April and May. Table 3.14 lists crop losses due to extreme weather events over the past 10 years.

Table 3.14: Crop Loss in Kings County Due to Severe Weather, 1997-2007

Date	Estimated Crop Losses	Extreme Weather Category
03/22/1997	\$20,000	Hail (1.5 inches)
05/01/1998	\$73,600,000	Heavy Rain
04/08/1999	\$3,400,000	Hail (1.0 inches)
06/08/2000	\$100,000	Heavy Rain
04/07/2001	\$3,800,000	Thunderstorm Wind/Hail
05/31/2002	\$10,000	Lightning
05/31/2002	\$200,000	Thunderstorm Wind (G-50)
04/21/2003	\$1,000	Heavy Rain
04/01/2003	\$8,900,000	Heavy Rain
05/14/2003	\$10,000	Thunderstorm Wind
04/28/2004	\$400,000	Lightning
05/08/2005	\$671,000	Heavy Rain
04/07/2006	\$2,200,000	Heavy Rain

Source: National Weather Service, 2007.

Heavy rain accounts for about 92 percent of these agricultural losses. Interestingly, no significant crop losses are attributed to freezes. This may be because the county has a limited amount of citrus and other crops particularly sensitive to freezing temperatures. Loss estimates in Kings County from the January 2007 freeze were estimated at \$91,400 in replanting costs by the Agricultural Commissioner's Office.

Social Vulnerability

Certain demographic and housing characteristics may amplify or reduce overall vulnerability to hazards. These characteristics, such as age, race/ethnicity, income levels, gender, building quality, public infrastructure, all contribute to social vulnerability.

A Social Vulnerability Index compiled by the Hazards and Vulnerability Research Institute in the Department of Geography at the University of South Carolina measures the social vulnerability of U.S. counties to environmental hazards for the purpose of examining the differences in social vulnerability among counties. Based on national data sources, primarily the 2000 census, it synthesizes 42 socioeconomic and built environment variables that research literature suggests contribute to reduction in a community's ability to prepare for, respond to, and recover from hazards (i.e., social vulnerability). Eleven composite factors were identified that differentiate counties according to their relative level of social vulnerability: personal wealth, age, density of the built environment, single-sector economic dependence, housing stock and tenancy, race (African American and Asian), ethnicity (Hispanic and Native American), occupation, and infrastructure dependence. Kings County ranks in the top 20 percent in the nation on the vulnerability index, which indicates highest social vulnerability, and ranks medium in the state of California.

To better understand the characteristics behind this ranking, the HMPC researched information from the 2000 census on four factors of social vulnerability: gender, age, race/ethnicity, and wealth/poverty. These factors were analyzed for Kings County as a whole, for each of the incorporated cities, and for the unincorporated communities of Armona, Home Garden, Kettleman City, and Stratford. One characteristic of social vulnerability is differential access to resources and greater susceptibility to hazards due to physical weaknesses. The plan considers the three factors related to this characteristic—gender, age, and race/ethnicity. A fourth factor, wealth and poverty, was also examined. Individuals and communities with greater wealth have more ability to absorb losses and be resilient in the face of disaster due to factors such as insurance and social safety nets. Table 3.15 displays these variables and compares them to the same variables for California and the United States.

Gender

Women may have a more difficult time recovering from disaster than men because of sector-specific employment, lower wages, and family care responsibilities. Kings County is 43 percent female, and there are no communities within the county with a significantly higher female percentage. Avenal (25.7 percent) and Corcoran (32.5 percent) both have disproportionately low female populations. This may be related to the state prisons in both communities. The data indicates that in the case of Kings County, gender is not a factor that increases the social vulnerability of the planning area.

Age

Age can affect the ability of individuals to move out of harm's way. The HMPC analyzed two variables for age, percentage of population over 65 and percentage under age 18. Overall, Kings County has a much younger population than California or the United States. Besides Hanford, most communities have much lower percentages of population over age 65 than the state or nation. Avenal has the smallest percentage of the population, only 3.3 percent, over age 65.

The unincorporated communities of the county have much higher percentages of population under age 18 than state or national averages—all are greater than 35 percent. In contrast, Avenal and Corcoran have smaller percentages of population under age 18, which may indicate when combined with gender data, the influence of the populations of the state prisons in these two communities. Although the low proportion of elderly residents in many areas lowers vulnerability; some of these areas also have a high percentage of children, which heightens vulnerability.

Race/Ethnicity

Race and ethnicity can create language and cultural barriers that affect communication of warning information and access to post-disaster funding. California has a much higher percentage of nonwhite residents (40.5 percent) than the United States (24.9 percent); and Kings County's percentage of nonwhite residents is higher than the state's at 46.3 percent. With the exceptions of Hanford, Lemoore, and Armona, the percentage of nonwhite residents in each of the other communities in Kings County is greater than 60 percent, with the highest in Kettleman City (73.4 percent).

Wealth and Poverty

Wealth and poverty also are indicators of social vulnerability. Low income and impoverished populations have fewer resources available for recovery and are more likely to live in structures of greater physical vulnerability. Wealthier communities often have greater capabilities to mitigate hazards and greater access to funds for recovery.

To compare wealth and poverty, the HMPC analyzed the percentage of individuals below the poverty level and the median home value in each community in Kings County. Kings County overall has a higher percentage of people living below the poverty level, 19.5 percent, than California (14.2 percent) or the nation (12.4 percent). Poverty is highest in the unincorporated areas of Kettleman City (43.7 percent) and Home Garden (41.9 percent). The median value of single-family, owner-occupied homes in Kings County in 2000 was \$97,600 compared to \$211,500 in California. Home values are highest in Lemoore and Hanford and lowest in Home Garden and Avenal.

These factors of social vulnerability hold many implications for disaster response and recovery and are important considerations when identifying and prioritizing mitigation actions and overall goals and objectives of the plan.

Table 3.15: Measures of Social Vulnerability from 2000 U.S. Census

Variable	Avenal	Corcoran	Hanford	Lemoore	Unincorporated Kings County				Kings County	CA	U.S.
					Armona	Home Garden	Kettleman City	Stratford			
Total Population	14,674	14,458	41,686	19,712	3,239	1,702	1,499	1,264	129,461		
Total Housing Units	2,061	3,016	14,721	6,823	1,012	437	329	311	36,563		
Percentage Females	25.7%	32.5%	51.0%	50.4%	51.5%	47.1%	44.8%	49.1%	42.6%	50.2%	50.9%
Percentage Under Age 18	21.9%	24.4%	31.6%	34.6%	35.4%	37.9%	36.3%	40.8%	29.0%	27.3%	25.7%
Percentage Over Age 65	3.3%	5.4%	10.3%	6.3%	7.1%	7.5%	4.3%	5.3%	7.4%	10.6%	12.4%
Percentage Nonwhite Residents	64.2%	65.9%	35.9%	40.7%	43.7%	66.5%	73.4%	66.5%	46.3%	40.5%	24.9%
Percentage Individuals Below Poverty Level ¹	30.7%	26.9%	17.3%	13.4%	26.6%	41.9%	43.7%	24.8%	19.5%	14.2%	12.4%
Median Value, Single-Family Owner-Occupied Homes	\$69,700	\$74,900	\$102,900	\$110,900	\$76,500	\$66,900	\$77,500	\$70,200	\$97,600	\$211,500	\$119,600

Source: U.S. Census, 2000, www.census.gov.

¹ The Census Bureau uses a set of money income thresholds that vary by family size and composition to determine who is in poverty.

Estimating Potential Losses

The HMPC ranked the significance of identified hazards for each jurisdiction. Significance is measured in general, qualitative terms and is a summary of the potential impact of the hazard based on the geographical area affected, history of past occurrences, potential magnitude, probability of the event, and damage and casualty potential. Significance is classified as the following:

- High:** Widespread potential impact. This ranking carries the highest threat to the general population and/or built environment. Hazards in this category may have already occurred in the past.
- Medium:** Moderate potential impact. This ranking carries a moderate threat level to the general population and/or built environment. The potential of occurrence may be the same as the high ranking, but the potential damage is more isolated and less costly than a more widespread disaster.
- Low:** Minimal potential impact. The occurrence and potential cost of damage to life and property is minimal.

Table 3.16 summarizes the hazard significance rankings developed by the HMPC for participating jurisdictions in Kings County. School districts are not included in the table. The planning significance of different hazards depends upon their location in the county. See the map in Annex G on page 2.

This section assesses vulnerability to those specific hazards ranked of medium or high significance. The HMPC identified three hazards within the planning area where specific geographical hazards are defined: earthquake, flooding, and wildfire. Critical facilities and other assets in these areas were assessed and are described below. The vulnerability to other medium to high significance hazards that do not have specific mapped areas, such as drought, extreme heat, freeze, and fog, are discussed in more general terms at the end of this section.

It is also important to be aware that hazard events that happen outside of the county boundaries also can have direct and indirect impacts to Kings County. For instance, dam failures and wildfires in watersheds outside the county that drain into it can result in flooding and other impacts related to watershed health. An earthquake or flood as far away as the Sacramento Delta Region could disrupt water supply to the county from the California Aqueduct. Power supply also could be interrupted by earthquake and wildfire hazards outside of the county.

Table 3.16 Significance of Hazard by Jurisdiction

Hazard	Kings County*	Avenal	Corcoran	Hanford	Lemoore	Armona Community Services District	Tulare Lakebed Reclamation Districts
Dam Failure	Low	Low	Low	Low	Medium	Low	High
Drought	High	Medium	High	High	Medium	Medium	Low
Earthquake	High	High	High	High	High	Low	Low
Extreme Heat	Medium	Medium	Medium	Medium	Medium	Medium	Low
Flood	Medium	Medium	High	Low	Low	Low	High
Fog	Medium	Medium	Medium	Medium	Medium	Medium	Low
Freeze	Medium	Low	Low	Medium	Medium	Low	Low
Landslide	Low	Low-Medium	Low	Low	Low	Low	Low
Tornado	Low	Low	Low	Low	Low	Low	Low
Wildfire	Medium	Low	Low	Low	Low	Low	Low

Source: Kings County Hazard Mitigation Planning Committee, 2007. *Unincorporated areas. Note: For the school districts, overall significance depends upon their location within the county. See Annex G.

Earthquake

Earthquake vulnerability is based primarily upon population and the built environment. When the M 7.9 Fort Tejon earthquake occurred along the San Andreas fault near Kings County in 1857, California was sparsely populated, especially in the regions of strongest shaking. This helped to reduce the loss of life and damage (Southern California Earthquake Center 2006). The California State Multi-Hazard Mitigation Plan (2004) predicts a repeat of the 1857 earthquake would cause approximately \$17 billion in property damage. CA-OES used FEMA's HAZUS loss estimation modeling tool to determine that approximately 16,000 people or 12.5 percent of the population of Kings County lives in a high seismic hazard zone of 40% g or higher.

To mitigate this hazard, building codes in California have been steadily improved over the past 80 years as understanding of seismic shaking has improved. Current California building codes include provisions for considering the potential shaking from earthquakes, including stronger shaking near faults and amplification by soft soils. The building code has been the main mitigation tool for seismic shaking in most buildings, although hospitals, schools, and other critical facilities are subject to additional mitigation measures (CA-SHMP 2004).

The state has an unreinforced masonry program, which requires seismic retrofits or building removal in Zone IV. Unreinforced masonry buildings are generally brick buildings constructed prior to 1933, predating modern earthquake-resistant design. The brick is not strengthened with embedded steel bars and is therefore called unreinforced. There are four seismic zones in the

United States ranging from I to IV; the higher the number, the higher the earthquake danger. All of California lies within Seismic Zone III or IV. Stronger construction standards for buildings in Zones III and IV have been adopted in the International Building Code. Most of Kings County is in Zone III except for the southwestern part, which is in Zone IV.

Estimating Potential Losses

FEMA's software program for estimating potential losses from disasters, HAZUS, was used to estimate potential losses in Kings County from two earthquake scenarios. The default inventory data associated with the May 2006 release of HAZUS-MH MR2, which includes 2005 building valuations, was used for the modeling. The first scenario was an annualized loss scenario representing long-term average losses based on overall local seismic hazard using a default M 7.0 assumption. A second deterministic scenario was run to model impacts of a modern day repeat of the 1857 Fort Tejon earthquake of M 7.9 at the same epicenter on the San Andreas fault. Table 3.17 on the following page summarizes the results of the two scenarios.

In the annualized loss scenario, HAZUS estimates that 1,017 buildings will be at least moderately damaged, which is approximately three percent of the total number of buildings in the region. Approximately 40 buildings are estimated to be damaged beyond repair. More than 95 percent of these buildings are classified as single family or other residential.

In the Fort Tejon event scenario, HAZUS estimates that about 1,211 buildings will be at least moderately damaged, which is over 4 percent of the total buildings in Kings County. Sixty buildings are estimated to be damaged beyond repair, 50 percent more than in the annualized loss scenario. More than 95 percent of these buildings are classified as single family or other residential. Most of the buildings predicted to sustain extensive to complete damage are manufactured housing.

Total economic losses are predicted to be three times greater in the Fort Tejon event scenario and casualty estimates are also predicted to be several times greater. HAZUS estimates the number of people that will be injured and killed by the earthquake broken down into four severity levels. The model provides casualty estimates for three times of day: 2:00 am, 2:00 pm, and 5:00 pm. Results for 2:00 am and 5:00 pm are shown in Table 3.17. The results for 2:00 pm are excluded, because they were the same as 5:00 pm.

HAZUS estimates that much of the damage to critical facilities and infrastructure will be similar for both scenarios. Hospitals are expected to retain functionality, as are most essential facilities, including schools, police stations, and fire stations. Damage to transportation systems is not predicted, except for moderate damage to at least one highway bridge. HAZUS does predict damage to the natural gas utility system and to potable water service. Approximately one-third of households may be without water on the day of the earthquake.

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. In both scenarios, the model estimates 57 households will be displaced and 16 people out of a total population of 129,641 will seek temporary shelter in public shelters. Fires often occur after an earthquake. Because of their

number and the lack of water to fight the fires, they can burn out of control. HAZUS estimates that there will be three ignitions that will burn about .02 square miles in the county. The model estimates that fires will displace about 57 people and burn about \$3 million in building value.

The HMPC also identified the potential impacts of a major earthquake in Los Angeles or San Francisco on the Central Valley and Kings County. Displaced people from these areas may come to the county and require sheltering, medical care, and other local resources.

Table 3.17: HAZUS-MH Earthquake Loss Estimation Summary for Annualized Loss and Fort Tejon Event Scenarios

Type of Impact	Annualized Loss Scenario M7.0	Fort Tejon Event Scenario M7.9
Total Buildings Damaged	1,017 at least moderately damaged (3% of total in region) 40 damaged beyond repair	1,211 at least moderately damaged (4% of total in region) 60 damaged beyond repair
Residential Buildings Damaged (single family and other residential)	Slight: 3,939 Moderate: 836 Extensive: 141 Complete: 40	Slight: 4,092 Moderate: 942 Extensive: 190 Complete: 59
Building-Related Losses	\$2.56 million	\$103.43 million
Total Economic Losses (building and lifeline losses)	\$50.23 million	\$151.10 million
Casualties (based on 2:00am occurrence)	Without requiring hospitalization: 1 Requiring hospitalization: 0 Life threatening: 0 Fatalities: 0	Without requiring hospitalization: 60 Requiring hospitalization: 11 Life threatening: 1 Fatalities: 2
Casualties (based on 5:00pm occurrence)	Without requiring hospitalization: 1 Requiring hospitalization: 0 Life threatening: 0 Fatalities: 0	Without requiring hospitalization: 47 Requiring hospitalization: 11 Life threatening: 2 Fatalities: 3
Damage to Transportation Systems	1 highway bridge, moderate damage	1 highway bridge, moderate damage
Households without Power/Water Service (based on 991,056 households)	No power loss predicted Water loss, Day 1: 11,326 Water loss, Day 3: 9,490 Water loss, Day 7: 5,639	No power loss predicted Water loss, Day 1: 11,326 Water loss, Day 3: 9,490 Water loss, Day 7: 5,639
Displaced Households	57	57
Shelter Requirements	16 people out of 129,461 in region	16 people out of 129,461 in region

Source: HAZUS-MH MR2, 2006.

Building losses are broken down 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 the inability to operate a business because of the damage sustained during the

earthquake. In the annualized loss scenario, the total building-related losses were estimated to be \$2.56 million. Six percent of the estimated losses were related to business interruption; and the largest losses were sustained by residential units (79 percent of total loss). Annualized loss estimates yielded much smaller losses, about two percent, of the building-related loss in the Fort Tejon scenario, which were \$103.43 million. Approximately 8 percent of the estimated losses were related to business interruption of the region; and the largest losses were sustained by residential units (77 percent of total loss). Table 3.18 shows estimated building-related losses by occupancy type for the Fort Tejon event scenario.

Table 3.18: Building-Related Losses in Millions of Dollars: Fort Tejon Event Scenario

Category	Single Family	Other Residential	Commercial	Industrial	Other	Total
Income Losses	\$.79	\$1.95	\$5.32	\$.09	\$.11	\$8.26
Structural	\$4.92	\$5.72	\$2.62	\$.41	\$.40	\$14.07
Nonstructural	\$27.40	\$24.69	\$7.48	\$1.33	\$.92	\$61.82
Content	\$8.61	\$5.48	\$3.56	\$.86	\$.44	\$18.95
Inventory	\$0	\$0	\$.16	\$.15	\$.02	\$.33
Total	\$41.72	\$37.83	\$19.14	\$2.84	\$1.89	\$103.43

Source: HAZUS-MH MR2, 2006.

Summary of Potential Impacts

According to the HAZUS model, Kings County is susceptible to serious earthquake losses in the millions of dollars. The overall impact of earthquakes to Kings County includes:

- Potential for injury and loss of life;
- Widespread structural damage, particularly in manufactured housing;
- Loss of water, power, roads, phones, and transportation, which can be particularly dangerous for those with certain medical conditions;
- Power loss complicating response and recovery efforts;
- Business interruption losses;
- Agricultural impacts such as field disturbances and damage to irrigation systems; and
- Damage to oil and gas facilities and pipelines.

The HAZUS earthquake model applies to census tract level data and does not allow for the quantification of risk by jurisdiction. Based on the earthquake shaking map and fault locations in the hazard profiles section, Avenal and the unincorporated community of Kettleman Hills are likely to experience stronger ground shaking than the rest of the county.

Older construction and unreinforced masonry buildings are more vulnerable to shaking during earthquakes. Historic buildings can be more susceptible because they have weakened with age and were built before the use of building codes. Most unreinforced masonry buildings in Kings County are in Hanford, where it is estimated there are 58. HAZUS predicts that building-related losses will primarily occur in manufactured housing in Kings County.

The Kettleman Hills Hazardous Waste Facility is located near several small faults in the Kettleman Hills. Due to the high classification of hazardous waste stored there and the past problems with landslide and leakage, there is some environmental risk in an earthquake event. The nearest community is Kettleman Hills, four miles away.

The California Aqueduct runs through western Kings County, where seismic hazards are high. Numerous natural gas and oil pipelines, telephone lines, and fiber optic cables also follow the Interstate 5 corridor in western Kings County. These are vulnerable to damage from seismic offset. Water wells and oil wells also could be damaged by subsurface slumping.

Flood

Despite the construction of massive and relatively effective flood control projects, California remains vulnerable to flooding. A steady rise in population and accompanying development contribute to increased flood risks throughout the state. According to the National Flood Insurance Program (NFIP), all four municipalities within Kings County have mapped flood hazard areas. The table below provides further information on their participation in the NFIP.

Table 3.19: Community Participation in the NFIP in Kings County

Jurisdiction	Date Joined	Effective FIRM Date	Policies	Number of Claims	Claims Amount
Avenal	04/05/1989	03/07/2000	1	0	0
Corcoran	11/28/1997	Adopted Kings County FIRM	2	0	0
Hanford	03/18/1987	03/18/1987	9	0	0
Lemoore	04/03/1987	04/03/1987	17	0	0
Kings County	08/04/1988	08/04/1988	144	4	\$16,700

Source: NFIP Community Status Book, 2006, and BureauNet, 2007, <http://bsa.nfipstat.com/>.

According to the California State Multi-Hazard Mitigation Plan (2004), there are no repetitive loss properties in Kings County. The NFIP defines a repetitive loss structure as "any building with two or more flood losses greater than \$1,000 in any 10-year period since 1978." Although this seems an encouraging statistic, it actually may reflect a lack of flood insurance policies in areas that have repetitive floods. The state plan estimates total population in the FIRM zone is 8,808 and in the 100-year flood zone (A) is 8,278. Based on a total population of 129,461, the percent of the population in Zone A is 6.4 percent. The following is additional information from the state plan for flood damages in Kings County:

Repetitive Loss Properties	0
Individual Assistance Damage Locations	96
Number of Individual Assistance Damage Locations in Zone A	5
Percent of Individual Assistance Damage Locations in Zone A	5.2%
Number of Public Assistance Applicants	59
Public Assistance Amount Eligible For	\$657,039

Estimating Potential Losses

GIS was used to quantify how flood risk varies across the planning area. FEMA Q3 digital floodplains were overlaid on the county's GIS layers of parcels and city boundaries. The parcel layer was linked with the assessor's data to quantify the value of property that lies in the floodplain. Improved parcel centroids that lie within Zone A and the X500 zone were then calculated to estimate structural values at risk. Zone A represents the flood hazard area for a 100-year flood, and X500 for the 500-year flood. The results of this analysis summarize the values at risk in the floodplain for unincorporated areas of the county and the cities of Avenal, Corcoran, Hanford, and Lemoore and are shown in Table 3.20 that follows.

Table 3.20: Structural Vulnerability to Flood Hazards in Kings County

Jurisdiction	Zone A		X500 Total	
	Structure Number	Structure Value	Structure Number	Structure Value
Avenal	5	\$98,033	1,393	\$80,716,733
Corcoran	12	\$721,413	12	\$721,413
Hanford	6	\$2,549,083	6	\$2,549,083
Lemoore*	0	\$0	203	\$31,125,037
Kings County	698	\$70,358,146	1,126	\$103,977,950
Total	721	\$73,726,675	2,740	\$219,090,216

Source: FEMA Q3 and AMEC. *In Lemoore, Leprino Foods Company is excluded from estimation but parcel is on fringe of FEMA Flood Zone A with value of \$63,679,451.

Summary of Potential Impacts

Most of the flooding in Kings County can be characterized as shallow, sheet flow events. This type of flooding often results in property damage, road washouts, and transportation disruptions. Other general impacts of these events may include the following:

- Potential for injury and loss of life;
- Commercial and residential structural damage;
- Loss of water, power, roads, phones, and transportation, which can be particularly dangerous for those with certain medical conditions;
- Economic impacts (jobs, sales, tax revenue) due to loss of commercial structures; and
- Decline in commercial and residential property values.

Most of the urban areas in Kings County are not located in mapped floodplain areas. Flood hazards exist primarily in the center of the county in the Tulare Lake Basin and along Cross Creek, the Kings River and the North and Clarks Forks of the Kings River, and in the valley between the Kettleman Hills and the Kreyenhagen Hills. Both Avenal and Lemoore have little to no exposure in the 100-year floodplain, though they have significant vulnerability to a 500-year flood. Corcoran has some limited exposure along its southwestern city boundary. Hanford has few structures at risk, but higher monetary value at risk. Near unincorporated communities, flood

hazards are mapped to the east of Kettleman City and to the northwest of Stratford. The Santa Rosa Rancheria has some urban flooding mapped in the southwest corner, though it does not appear to affect the casino or other structures.

Few critical facilities are located in the 100-year floodplain. The Central California Soaring Club Airport and Highway 33 in Avenal do occur in this hazard area. Much of Avenal lies in the 500-year floodplain, which is primarily affected by sheet flow flooding. Facilities located here include the fire station, medical clinic, superior court, and Avenal Elementary School.

No cultural or historical sites are known in flood areas based upon available data. Risk analysis of natural resources was not possible due to data limitations. Natural areas within the floodplain often benefit from periodic flooding as a naturally recurring process. In addition, natural areas help mitigate flood impacts by absorbing flood waters.

In terms of economic assets, most dairy facilities are not located in flood hazard areas, except for a few in the Cross Creek floodplain in the northeastern part of the county. The Paramount Pomegranate Orchards are located in a mapped flood hazard area near the southern border of the county. In the mapped flood hazard area of the Tulare Lake Basin, the improved parcel data indicates that there is approximately \$36 million in total structural value exposed, in addition to the value of the crops cultivated in this area.

Wildfire

Vulnerability to wildfire is predominantly associated with wildland-urban interface (WUI) areas. The WUI is a general term that applies to development interspersed or adjacent to forests and wildlands. WUI areas are a major focus of the California Department of Forestry and Fire Protection's (CDF) fire management strategy.

In Kings County, WUI areas occur primarily in the southwestern part of the county near Avenal. Much of the area with the highest fire hazard is isolated with few urban settlements and vulnerability is considered low in the safety element of the Kings County General Plan. There is also limited exposure to wildfire in the grass lands. When considering the planning area as a whole, limited fuel loading, along with the geographical and topographical features of the area, limit the potential for fires resulting in loss of life and property. However, any fire has the potential to quickly become a large, out-of-control fire, particularly when combined with natural weather conditions common to the area, which include periods of drought, high temperatures, and low relative humidity. Even the flat, urbanized portion of the planning area has some fire risk (Kings County EOP 2002).

CDF generated a list of communities at risk for wildfire as required by the National Fire Plan. The National Fire Plan is a cooperative, long-term effort between various government agency partners with the intent of actively responding to severe wildland fires and their impacts to communities while ensuring sufficient firefighting capacity for the future. Three main factors were used to determine wildfire threat in the wildland-urban interface areas of California. These include ranking fuel hazards, assessing the probability of wildfire, and defining areas of suitable housing density that could create WUI fire protection strategy situations. Avenal is the only Community at Risk in Kings County listed in the Federal Register. Avenal is in a Local

Responsibility Area, protected by the Kings County Fire Department. Most of the area to the west of Highway 33 is CDF State Responsibility Area for fire protection.

Kings County is in CDF's Fresno-Kings Unit. Most fire starts in local responsibility areas in the Fresno-Kings Unit are related to motor vehicles, equipment use, and arson (Fresno-Kings Unit Pre-Fire Management Plan 2005).

Estimating Potential Losses

To assess the property at risk in very high fire threat areas, AMEC used CDF's fire threat data and the County's GIS parcel layer linked to the assessor's data to determine the improved parcel centroids that lie within the 2,400-meter buffer of a very high fire threat. Table 3.21 shows the results of this analysis by structure number and value for each jurisdiction. Only in Avenal and in unincorporated areas in the western part of the county are there structures located in very high fire threat areas.

Table 3.21: Structural Vulnerability to Wildfire Hazards in Kings County

Jurisdiction	Very High Fire Threat	
	Structure Number	Structure Value
Avenal	35	\$637,272
Corcoran	0	\$0
Hanford	0	\$0
Lemoore	0	\$0
Kings County	284	\$309,063
Total	319	\$946,335

Source: CDF and AMEC, 2007.

Summary of Potential Impacts

The overall potential impacts from wildfire include:

- Potential for injury and loss of life;
- Commercial and residential structural damage;
- Impacts to water quality and watershed health;
- Impacts to natural resource habitats and other resources, such as agriculture,
- Loss of water, power, roads, phones, and transportation;
- Significant economic impacts (jobs, sales, tax revenue) with the loss of commercial structures; and
- Decline in commercial and residential property values.

Large, past burn areas are located in high fire threat areas mapped along the west side of Interstate 5. There are not other known critical facilities in very high to extreme fire threat areas.

Although there are not significant timber resources in Kings County, wildfires can destroy crops affecting the economy.

Drought

All of Kings County is vulnerable to drought. Drought is one of the few hazards with the potential to impact all the citizens of the county through water restrictions, economic losses, and increased energy costs. The urbanized areas of the county and the agriculture industry are most likely to experience hardships associated with reduced water supply.

Agriculture in the San Joaquin Valley relies on artificial irrigation using mostly imported water and/or groundwater. Local droughts are expected and accommodated for; however, a prolonged statewide drought could exceed local capabilities to handle reductions of imported surface water supplies and potentially lead to reductions in distribution from local water storage districts.

The costs of drought are difficult to quantify because the impacts affect so many different sectors including wildlife and natural resources, business and industry, tourism and recreation, agriculture, and individual households. Agriculture often suffers the most financial losses from drought and is the major component of the Kings County economy. According to the Kings County Economic Development Corporation, the gross value of all agricultural crops and products produced during 2005 in Kings County was \$1,407,091,000. Assuming a future drought causes a 20 percent loss of that total value, losses would be in the vicinity of \$280 million. Costs would be associated with 1) economic damage to major crops, 2) lost revenues from the fallowing of land, and 3) costs associated with increased groundwater pumping and lowering of the water table. The following excerpt is taken from Colorado River Basin Climate (2005), a special publication for the Association of California Water Agencies and Colorado River Water Users Association:

Future water use planning for southern California is complex, having to account for increasing population size coupled with decreasing availability of water for import as Northern California waters are drawn upon for ecological functioning in areas such as the San Francisco Bay and Owens Valley, or Colorado River waters are fully used by the Lower Basin States. In addition, the possible impact of global climate change remains an open question. However, it is also important to at least consider the potential impacts and mitigation strategies for prolonged multi-year episodes (greater than 5 to 10 years) of widespread drought that would impact local supplies, storage capacity and demands, while at the same time limiting water available for import from Northern California and from the Colorado River Basin due to simultaneous prolonged droughts in those regions.

Extreme Heat

The agricultural industry is most at risk to extreme temperatures. Hot and cold temperature extremes damage crops, affecting the economy and potentially resulting in lost farming jobs. Field workers are susceptible to heat exhaustion and heat stroke. Elderly residents who may live alone and are limited in their mobility are also vulnerable during heat waves.

Problems with power loss and water distribution also occur during periods of extreme heat. Power outages and rolling brownouts can result when high temperatures increase air conditioner use. Power outages have prevented water pumping stations from operating.

Freeze

Prolonged freezing temperatures can damage or destroy crops, affecting the economy and agricultural jobs in Kings County. More information on these losses can be found in the Economic Assets section of the previous section on pages 51-52. Water infrastructure is also at risk from freezing, including line breaks and frozen valve gates affecting the distribution system. The county and municipal governments wrap pipes before freezing temperature events to help prevent damage.

Fog

Fog contributes to transportation accidents and is a significant life safety hazard. These accidents can cause multiple injuries and deaths and could have serious implications for human health and the environment if a hazardous or nuclear waste shipment were involved. Other disruptions from fog include delayed emergency response vehicles and school closures. Highways and busy intersections during traffic rush hours are vulnerable areas during severe fog events.

Development Trends

As part of the planning process, the HMPC looked at changes in growth and development and examined these changes in the context of hazard-prone areas and how the changes in growth and development affect loss estimates and vulnerability. The U.S. Census Bureau estimated the 2006 population of Kings County to be 147,729. This is an increase of 14 percent from the 2000 census population of 129,461. From July 1, 2005, to July 1, 2006, Kings County had the ninth highest growth rate among California counties. Table 3.22 shows the population growth in Kings County from 1960 to 2006. Table 3.23 shows projected growth estimates from the California Department of Finance for Kings County for 2000 to 2050.

Table 3.22: Population Growth in Kings County, 1960-2006

	1960	1970	1980	1990	2000	2006
Population	49,954	66,717	73,738	101,469	129,461	147,729
Growth Rate		33.6%	10.5%	37.6%	27.6%	14.1%

Source: U.S. Census 2000 analyzed by the Social Science Data Analysis Network.

Table 3.23: Kings County Population Growth Projections, 2000-2050

	2000	2010	2020	2030	2040	2050
Population	129,823	156,334	184,751	223,767	252,762	282,364
Growth Rate		20.4%	18.2%	21.1%	13.0%	11.7%

Source: California Department of Finance, 2004.

Table 3.24: Population Growth for Jurisdictions in Kings County, 2000-2006

Jurisdiction	2000 Population	2006 Population	Percent Change
Avenal	14,674	16,349	11.4%

Corcoran	20,835	23,448	12.5%
Hanford	41,686	49,048	17.7%
Lemoore	19,712	23,388	18.6%
Kings County*	30,888	35,496	14.9%
Total	127,795	147,729	13.5%

Source: U.S. Census Bureau, 2007. *Unincorporated areas.

Table 3.25: Growth in Housing Units for Jurisdictions in Kings County, 2000-2006

Jurisdiction	2000 Housing Units	2006 Housing Units	Percent Change
Avenal	2,061	2,251	9.2%
Corcoran	3,016	3,367	11.6%
Hanford	14,721	16,867	14.6%
Lemoore	6,823	7,859	15.2%
Kings County*	9,942	10,252	3.1%
Total	36,563	40,596	11.0%

Source: Source: U.S. Census Bureau, 2007. *Unincorporated areas.

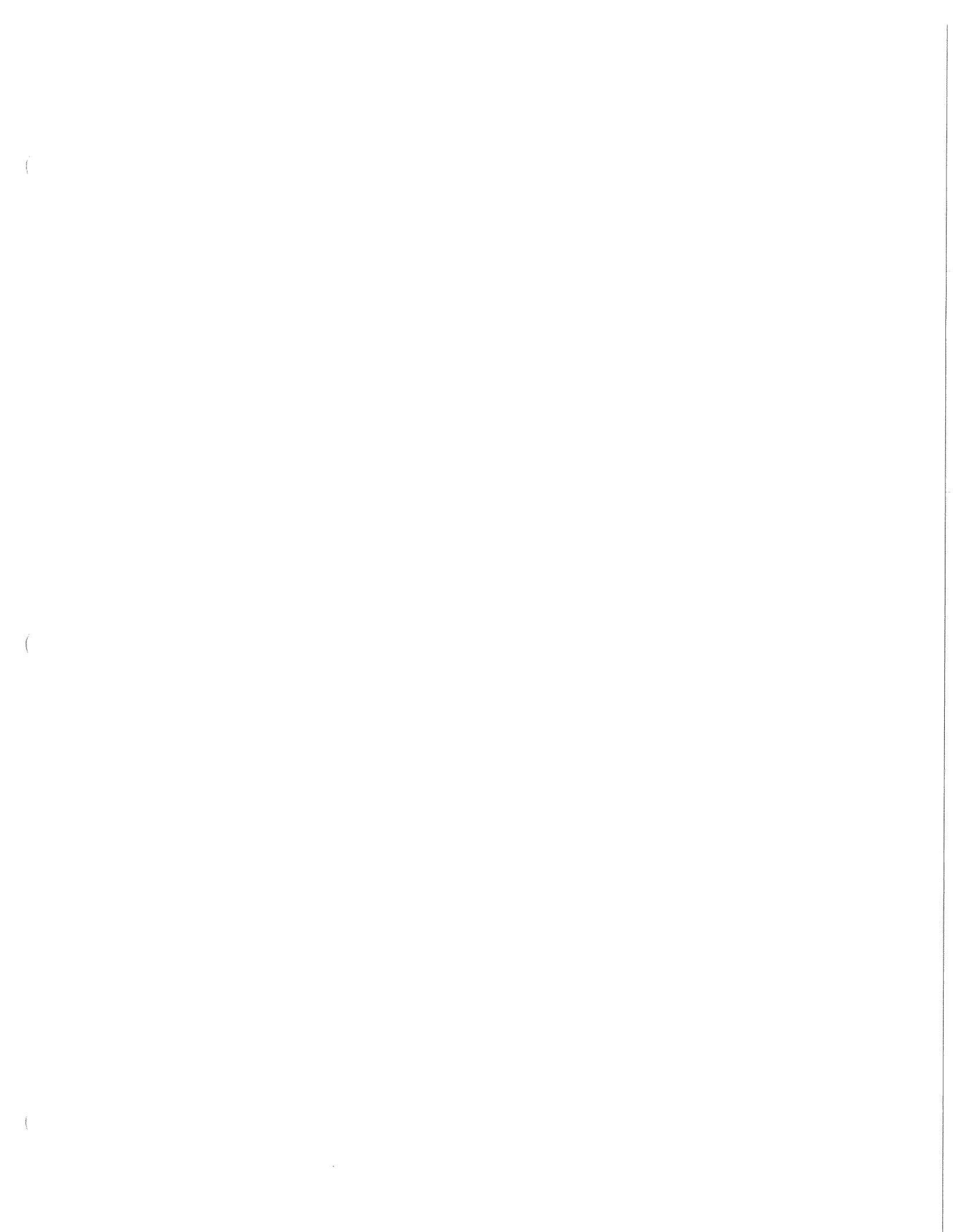
Census estimates indicate that the highest population growth between 2000 and 2006 occurred in Lemoore, which grew by 18.6 percent, and population growth was slowest in Avenal, which grew by 11.4 percent. There is currently a proposal under review to develop a new city in the western part of the county of a population of 75,000. More specific information on growth and development for each community can be found in the Jurisdictional Annexes.

Upward trends in population growth and development in Kings County increase vulnerability to hazards, including earthquakes, flooding, wildfire, and drought. Modern, well-constructed buildings built to code are more resistant to earthquake shaking. However, new buildings can be severely damaged if built upon areas susceptible to soil liquefaction. The risk of flooding in future development should be minimized by the floodplain management programs of the county and its municipalities, if properly enforced. Vulnerability to wildfire will increase with more development in WUI areas in the western part of the county and will increase the fire protection challenges in the area. Lastly, as the population grows, so do the water needs for household, commercial, industrial, recreational, and agricultural uses. Vulnerability to drought will increase with these growing water needs.

3.4 RISK ASSESSMENT SUMMARY AND CONCLUSIONS

The Kings County Risk Assessment revealed a number of problem areas to be addressed in the mitigation strategy. These key findings are summarized in the following list:

- The largest recorded earthquake in California history occurred 35 miles west of Kings County in 1857 causing severe ground shaking. Scientists predict a 7.5-7.8 magnitude earthquake on this section of the San Andreas fault is 30 to 70 percent likely to occur in the next 30 years. HAZUS predicts a similar earthquake to the 1857 Fort Tejon event would cause approximately \$150 million in total economic losses to Kings County, and



one-third of homes in the county would be without water for the first day of the earthquake. Critical facilities, historic buildings, and manufactured housing are at risk.

- Kettleman City is one of the most socially vulnerable communities in the county with the highest poverty rate, highest percentage of nonwhite residents, and highest percentage of population under age 18. Kettleman City also occurs in a high seismic hazard area, four miles from a hazardous waste facility, has a high amount of manufactured housing, and has potential for substantial growth.
- The city of Avenal is located in the most hazardous area of the four cities, with greater risk to earthquake, wildfire, and landslides, and is more isolated from medical facilities.
- The risk assessment indicates that there is greater population in earthquake hazard areas of the county (12.5 percent of the population) than in high flood hazard areas (6.4 percent).
- Most past disaster declarations have occurred due to severe storms and flooding (nine); others have been for drought and freezes. Losses are primarily related to agriculture. Heavy rain is the most frequent cause of crop losses.
- In the mapped flood hazard area of the Tulare Lake Basin, the improved parcel data indicates that there is approximately \$36 million in total structural value exposed, in addition to the value of the crops cultivated in this area. Overall, this area has greater economic value exposed to the 100-year flood than any of the cities in Kings County.
- Extreme heat is a common occurrence in Kings County and is especially dangerous for farm workers and the elderly.
- Fog contributes to transportation accidents on an annual basis.
- Upward trends in population growth and development in Kings County increase vulnerability to hazards, including earthquakes, flooding, wildfire, and drought.

4. MITIGATION STRATEGY

44 CFR 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 presents the mitigation strategy developed by the HMPC based on the risk assessment. The mitigation strategy was developed through a collaborative group process and consists of goals, objectives, and mitigation actions. The following definitions are based upon those found in FEMA publication 386-3, *Developing a Mitigation Plan* (2002):

- **Goals** are general guidelines that explain what you want to achieve. Goals are defined before considering how to accomplish them so that they are not dependent on the means of achievement. They are usually long-term, broad, policy-type statements.
- **Objectives** define strategies or implementation steps to attain the identified goals and are specific and measurable.
- **Mitigation Actions** are specific actions that help achieve goals and objectives.

4.1 GOALS AND OBJECTIVES

44 CFR 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.

The HMPC developed goals and objectives to provide direction for reducing hazard-related losses in Kings County. These were based upon the results of the risk assessment and a review of community goals from other state and local plans. The HMPC reviewed goals from the following plans to ensure their mitigation strategy was integrated with existing plans and policies:

- State of California Multi-Hazard Mitigation Plan, 2004
- California Fire Plan, 1996
- Fresno-Kings Unit County Pre-Fire Management Plan, 2005
- Kings County Emergency Operations Plan, 1996
- Kings County General Plan, 1993 and 2007

Through a brainstorming process at their third meeting, the HMPC identified a variety of possible goals and then came to a consensus on four main ones. Following the development of goals, the HMPC identified specific objectives to achieve each goal. Goals and objectives are listed below, but are not prioritized:

Goal 1 Reduce impacts of natural hazards to life, property, and the environment

- Promote education and awareness about natural hazards risk, mitigation, and preparedness to citizens, public agencies, elected officials, nonprofit organizations, and businesses
- Ensure protection and enhancement of key emergency access routes
- Protect critical facilities and infrastructure to minimize loss of critical services
- Minimize growth and development in hazard areas
- Improve enforcement of existing standards and regulations

Goal 2 Minimize impacts of natural disasters to agriculture and the economies of communities

- Encourage water conservation measures among urban, rural, and agricultural users
- Increase water storage to mitigate flooding and drought
- Develop plans for post-disaster recovery
- Strengthen disaster resistance and resiliency of major employers

Goal 3 Implement identified mitigation activities

- Promote hazard mitigation as integrated policy among communities in the county and with the region and state
- Increase communication regarding mitigation among communities in the county.
- Seek funding sources and partners for future mitigation activities
- Improve organizational capabilities to address health and safety issues in mitigation and response

4.2 IDENTIFICATION AND ANALYSIS OF MITIGATION ACTIONS

44 CFR 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.

To identify and analyze potential mitigation actions to achieve the mitigation goals, each hazard identified in Section 3.1 was evaluated. Only those hazards that pose a threat to the community were considered further in the development of hazard specific mitigation measures. These hazards include:

- Drought
- Earthquake
- Extreme Heat
- Flood
- Fog

The HMPC eliminated other hazards from further consideration in the development of mitigation actions, because the risk of the hazard occurring within the county is unlikely, or because if the hazard did occur, the vulnerability of the county is low or existing capabilities are in place to mitigate the effects. It is important to note that many of the final mitigation actions are multi-hazard actions designed to reduce potential losses in all types of hazard events.

Once it was determined which hazards warranted the development of specific mitigation measures, the HMPC analyzed a list of potential structural and nonstructural mitigation alternatives identified based upon the risk assessment, existing capabilities, and identified goals and objectives. Each committee member was provided with the STAPLEE prioritization criteria recommended by FEMA. STAPLEE stands for: social, technical, administrative, political, legal, economic, and environmental, which are the factors that should be considered when assessing mitigation measures. Through a collaborative group process, the HMPC used STAPLEE to identify the specific mitigation actions from among the alternatives that are most likely to be implemented and effective. The HMPC then prioritized these mitigation actions through a multi-voting, dot-prioritization process.

This process of identification and analysis of mitigation alternatives allowed the HMPC to come to consensus and to prioritize recommended mitigation actions. Emphasis was placed on the importance of a cost-benefit analysis in determining project priority; however, this was not a quantitative analysis. The Disaster Mitigation Act regulations state that benefit-cost review is the primary method by which mitigation projects should be prioritized. In the state ranking, benefit-cost review is one of ten criteria, and although the overall priority of the criteria is not stated, benefit-cost review is listed last. Recognizing the federal regulatory requirement to prioritize by benefit-cost and the need for any publicly funded project to be cost-effective, the HMPC decided to pursue implementation according to when and where damages occur, available funding, political will, jurisdictional priority, and priorities identified in the California State Hazard

Mitigation Plan. Cost effectiveness will be considered in additional detail when seeking FEMA mitigation grant funding for eligible projects identified in this plan.

4.3 IMPLEMENTATION OF MITIGATION ACTIONS

44 CFR Requirement §201.6(c)(3)(ii): The mitigation strategy shall include an action strategy describing how the actions identified in paragraph (c)(2)(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 benefits review of the proposed projects and their associated costs.

The HMPC developed 17 mitigation actions, which are summarized in Table 4.1 on the following page. At their meeting, the HMPC came to consensus on the person and department responsible for completing an implementation worksheet for the county for each identified mitigation action. The worksheet includes information on the background issues, possible alternatives, responsible office, cost estimate, benefits, potential funding, and schedule for each action.

Following this HMPC meeting, the representative from each participating jurisdiction, coordinated a meeting with the planning team for their individual jurisdiction to develop mitigation action implementation worksheets. Using the STAPLEE criteria, the jurisdictional planning teams chose from the 26 mitigation actions those that they would like to implement in their jurisdiction. They also identified new actions specific to the risks in their jurisdiction. Appropriate team members were assigned to complete implementation worksheets for each identified action.

Mitigation action implementation worksheets for each jurisdiction are provided in their annex. The table on the following page summarizes all identified actions and the jurisdictions adopting them, as well as information on the hazards addressed and which plan goals the actions are meant to achieve.

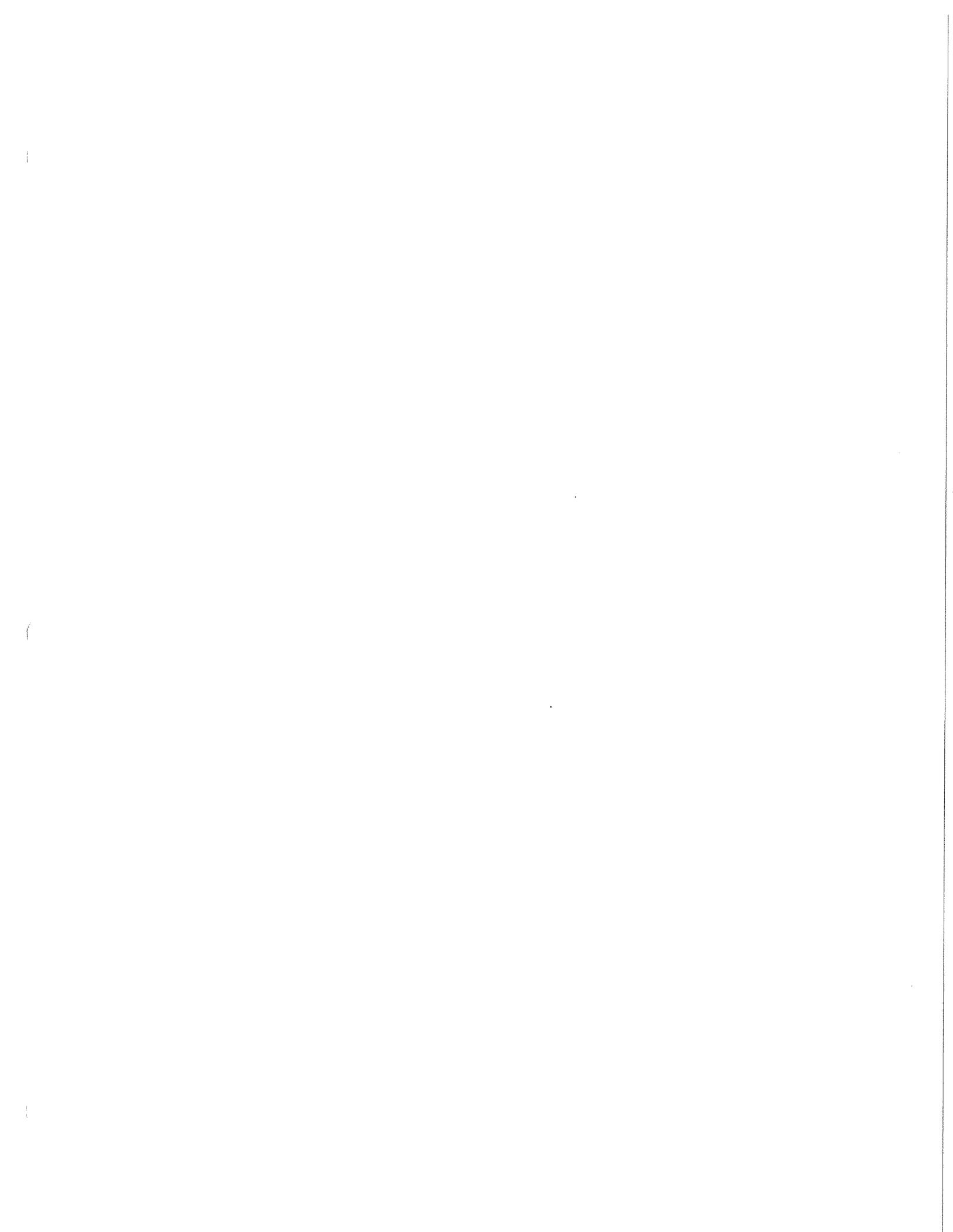
Table 4.1 Summary of Mitigation Actions

Mitigation Action	Links to Goals	Hazards Addressed	Kings County	Avenal	Corcoran	Hanford	Lemoore	ACSD	School Districts	Tulare Labeled Districts
Improve coordination, planning, and investment in long-term water supplies to meet demands of ongoing growth and development	1, 2, 3	Drought, MH	X				X			
Enhance existing centralized, interjurisdictional GIS program to improve capabilities in mitigation, preparedness, and response for all hazards.	1, 2, 3	MH	X				X			
Assess vulnerability of critical infrastructure and lifeline utilities, including water distribution systems, to identify and prioritize projects for multi-hazard risk reduction.	1, 2	MH	X		X	X	X			
Assess vulnerability of critical facilities, including police/fire stations, hospitals, schools, and others, to identify and prioritize projects for multi-hazard risk reduction.	1, 2	MH			X	X	X			
Review and update items related to the Kings County Area Disaster Council in the Kings County Emergency Services Ordinance to improve countywide coordination and the monitoring and implementation of the mitigation plan.	3	MH	X				X			
Develop and implement a comprehensive strategy to improve ongoing public education regarding natural hazards and risk.	1, 3	MH	X				X			
Develop a program or system for supporting vulnerable populations during emergency events.	1, 3	MH	X	X	X		X			
Implement natural hazards review criteria for new development to improve long-term loss prevention.	1, 2, 3	MH	X	X	X					

Mitigation Action	Links to Goals	Hazards Addressed	Kings County	Avenal	Corcoran	Hanford	Lemoore	ACSD	School Districts	Tulare Lakebed Districts
Integrate the hazard mitigation plan with the safety elements of general plans.	3	MH	X	X	X					
Update flood damage prevention ordinance to include new FEMA digital flood insurance rate maps.	1, 3	Flood	X	X			X			
Ensure the maintenance and enhancement of established disaster evacuation routes.	1, 2	MH	X							
Improve lighting and traffic controls at critical intersections and roadways to improve safety during fog events.	1	Fog	X							
Adopt the 2006 International Building Code to improve disaster-resistance of future buildings.	1, 2, 3	MH	X	X	X	X	X			
Develop a plan for supporting medically fragile and special needs students at each school site during emergency events.	1	MH	X						X	
Train school maintenance crews to identify and address nonstructural hazards in schools to mitigate earthquake risk.	1	Earthquake	X						X	
Establish a livestock disposal plan and compost team to address livestock fatality during extreme heat events.	1, 2	Extreme Heat	X							
Continue and enhance housing rehabilitation program.	1, 2	Earthquake		X						
Reduce vulnerability of water distribution system.	1, 2	Flood, Landslide		X						
Establish a loss reduction program for unreinforced masonry (URM) buildings in compliance with the California URM Law of 1986.	1	Earthquake		X						
Preserve open space in the floodplain through regulatory and nonregulatory methods.	1, 2, 3	Flood		X						

Mitigation Action	Links to Goals	Hazards Addressed	Kings County	Avenal	Corcoran	Hanford	Lemoore	ACSD	School Districts	Tulare Lakebed Districts
Expand the Veterans' Memorial Building and designate it as an emergency shelter.	1	Extreme Heat, MH			X					
Complete seismic retrofits of two of city's water storage tanks.	1, 2	Earthquake				X				
Develop GIS database of unreinforced masonry (URM) buildings.	1, 2	Earthquake				X				
Retrofit 58 unreinforced masonry buildings in downtown Hanford.	1, 2	Earthquake				X				
Install emergency power generator at Well No. 1	1, 2	MH						X		
Provide educational materials about natural hazards and risks in Kings County to customers in utility bills.	1, 3	MH						X		
Raise levee to improve protection of agricultural lands and property from flood hazards.	1, 2	Flood								X
Convert pump station to electric power to improve reliability of flood protection.	1, 2	Flood								X

Source: Kings County HMPC, 2007



5. PLAN MAINTENANCE PROCESS

This chapter 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 chapter also discusses incorporating the plan into existing planning mechanisms and how to address continued public involvement.

Plan Implementation and Maintenance

Implementation and maintenance are critical to the plan's overall success. While this plan makes many important recommendations, decisions about which actions to undertake first will be the first task facing the HMPC. Two factors will help in decision making. First, during the planning process, the HMPC identified high priority actions. Second, funding availability will affect decisions. Low or no cost, high-priority recommendations have the greatest chance of successful implementation.

Another highly-effective and low cost implementation mechanism is to incorporate the mitigation plan recommendations into other community plans and mechanisms, such as comprehensive planning, capital improvement budgeting, economic development goals and incentives, or other regional plans. Mitigation is most successful when it is incorporated in the day-to-day functions and priorities of government and in land use and development planning. This integration can be accomplished through identifying multi-objective, win-win programs and projects and through the routine actions of monitoring agendas, attending meetings, sending memos, and promoting safe, sustainable communities.

Simultaneous to these efforts, potential funding opportunities to implement some of the more costly recommendations should be constantly monitored. This will include creating and maintaining a bank of ideas on how local match or participation requirements can be met. When funding does become available, the HMPC will be in a position to capitalize on the opportunity. Funding opportunities to be monitored may include special pre- and post-disaster funds, special district budgeted funds, state or federal earmarked funds, and grant programs, including those that can serve or support multi-objective applications. Additional mitigation strategies include consistent and ongoing enforcement of existing rules and regulations and vigilant review of countywide programs for opportunities for better coordination.

5.1 MONITORING, EVALUATING, AND UPDATING THE PLAN

44 CFR Requirement 201.6(c)(4): 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.

Hazard Mitigation Coordinating Committee

With adoption of this plan, the HMPC will be tasked with plan monitoring, evaluation, and maintenance as the ongoing Hazard Mitigation Coordinating Committee (HMCC) led by the Kings County Office of Emergency Services. The committee agrees to:

- Meet annually and after a disaster event to monitor and evaluate the implementation of the plan
- Act as a forum for hazard mitigation issues and disseminate hazard mitigation ideas and activities to all participants
- Pursue the implementation of high priority, low- or no-cost recommended actions
- Maintain vigilant monitoring of multi-objective, cost share and other funding opportunities to assist the community in implementing the plan's recommended actions
- Keep the concept of mitigation in the forefront of county and city decision making by identifying plan recommendations when other community goals, plans, and activities overlap, influence, or directly affect increased community vulnerability
- Report on plan progress and recommended changes to the Board of Supervisors and governing bodies of participating jurisdictions
- Inform and solicit input from the public

The committee is an advisory body and will not have any powers over county staff. Its primary duty is to see the plan successfully carried out and to report to the community governing boards and the public on the status of plan implementation and mitigation opportunities. Other duties include reviewing and promoting mitigation proposals, hearing stakeholder concerns about hazard mitigation, passing concerns on to appropriate entities, and posting relevant information on the county website.

The Kings County Area Disaster Council is established by ordinance and convened regularly in past years but has not met in recent years. If the Disaster Council becomes more active in the future, this entity may be coordinated with the HMCC or may replace it as the advisory body that oversees plan monitoring, evaluation, and updating.

Plan Monitoring and Evaluation

To track progress and update the mitigation strategy, the HMCC will revisit the Kings County Multi-Hazard Mitigation Plan annually and after a hazard event. The Kings County Emergency Services Coordinator is responsible for initiating this review. Progress evaluation should be achieved by monitoring changes in vulnerabilities identified in the plan, including reduced

vulnerability as a result of implementing recommended actions and increased vulnerability as a result of failed or ineffective mitigation action or of new development or annexation.

To evaluate any changes in vulnerability as a result of plan implementation, the HMCC will use the following process. A representative from the responsible office identified in each mitigation action will be responsible for tracking and reporting the status of the action to the HMCC on an annual basis. The representative will provide input on whether the action, as implemented, meets the defined goals and objectives and is any results on the effectiveness of the action. If the action does not meet identified objectives, the HMCC will determine what additional measures may be implemented, and an assigned individual will be responsible for defining project scope, implementing project, monitoring success of project, and making any required modifications to the plan.

Updating the Plan

A five-year update of the plan will be submitted to the state and FEMA Region IX, unless disaster or other circumstances (e.g., changing regulations) lead to a different timeframe. Plan maintenance implies an ongoing effort to monitor and evaluate the plan's implementation and make updates as progress, roadblocks, or changing circumstances are recognized. Updates to this plan will document and incorporate the following:

- Success stories where mitigation efforts have proven effective
- Areas where mitigation actions were not effective
- Any new hazards that may arise or were previously overlooked
- New data or studies on hazards and risks
- New capabilities or changes in capabilities (i.e., planning and zoning)
- Growth and development-related changes to facilities and assets
- New project recommendations or changes in project prioritization

The plan should be changed to reflect projects that have failed or are not considered feasible after a review of consistency with established criteria, timeframe, community priorities, and funding resources. Priorities that were not ranked high but identified as potential mitigation strategies should be reviewed during the monitoring and update of the plan to determine the feasibility of future implementation. Updating of the plan will be by written changes and submissions, as the HMCC deems appropriate and necessary, and as approved by the governing board of each participating jurisdiction. In keeping with the process of adopting the plan, a public involvement process to receive public comment on plan maintenance and updating should be held during the annual review period and the final product adopted by the governing boards.

5.2 INCORPORATION INTO EXISTING PLANNING MECHANISMS

44 CFR 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.

Based on the capability assessment described previously, communities in Kings County continue to plan and implement programs to reduce losses to life and property from natural hazards. This plan builds upon the momentum developed through previous and related planning and mitigation efforts and recommends implementing projects through the following plans, where possible:

- General Plans and zoning codes of participating jurisdictions
- Kings County Operational Area Emergency Operations Plan
- Capital Improvements Plans in the county
- Other community plans within the county, such as water master plans, stormwater management plans, and parks and recreation plans
- The Fresno-Kings Unit Pre-Fire Management Plan and any Local Fire Safe Plans and Community Wildfire Protection Plans that may be developed in the future
- Other plans and policies outlined in the capability assessment section of this plan

The General Plan for Kings County is currently being updated. The mitigation plan will be a primary source used to update the Safety Element of the General Plan. The Safety Element will be updated on a five-year cycle consistent with the mitigation plan to improve efficient use of county resources and to improve consistency within county plans and policies.

5.3 CONTINUED PUBLIC INVOLVEMENT

44 CFR 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.

The update process provides an opportunity to publicize success stories from the plan's implementation and seek additional public comment. A public hearing(s) to receive public comment on plan maintenance and updating should be held during the annual review and five-year update periods. When the HMPC reconvenes for the update they will coordinate with all stakeholders participating in the planning process—or that have joined the committee since inception of the planning process—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, primarily newspapers.



ANNEX A: UNINCORPORATED KINGS COUNTY

COMMUNITY PROFILE

There are four main community areas in unincorporated Kings County—Armona, Home Garden, Kettleman City, and Stratford. The Board of Supervisors is the governing body for Kings County and many special districts. Each of the five members of the board is elected on a nonpartisan basis to a four-year term.

Geography and Climate

Kings County encompasses approximately 1,435 square miles. It is located slightly south of the geographic center of California and occupies part of the San Joaquin Valley and a portion of the eastern slope of the California Coast Ranges. Kings County is bounded on the southwest by the Coast Ranges, on the north and west by Fresno County, to the east by Tulare County, and to the south by Kern County.

Most of the county is relatively flat. However, elevation ranges from a low of 175 feet above mean sea level in the Tulare Lakebed, to 3,500 feet above mean sea level in the southwest, where the Kettleman Hills and the Kreyenhagen Hills are located. The county is located in the Tulare Lake hydrologic region that comprises the extreme southern portion of the Central Valley. The rivers in this region include the Kings, Kaweah, Tule, and Kern, which all historically drained into the Tulare Lake. The lake was once of substantial size during wet periods but over time, reclamation districts built levees and reclaimed the more than 200,000-acre lakebed for agriculture. The four rivers were diverted upstream and canals were built to drain the lake.

The climate in Kings County can be classified as Mediterranean with average rainfall rates of 7.6 inches annually, occurring primarily between November and April. The average annual temperature is 62 degrees Fahrenheit (°F), although it is not unusual for summer readings to reach well over 100°F. Extreme winter lows fall into the teens on rare occasions. The first freeze usually occurs in December and the last in March. Fog is common during the winter months and can settle in for periods of up to two weeks.

Both Interstate 5 and Highway 198 cross the county and connect to State Routes 41 and 43 and a network of other state highways and county roads. Kings County is served by the Burlington Northern Santa Fe Railroad, and the San Joaquin Valley Railroad. The nearest major airport is Fresno Yosemite International Airport, located approximately 30 miles north of the county line.

History

When the first white settlers arrived in Kings County, the indigenous population consisted of the Tache tribe of the Yokut Indians. The Yokuts controlled the entire San Joaquin Valley from the delta to Tejon Pass. The first white settlement was a ferry situated on the south bank of the Kings River where the Overland stage route crossed. Known as Kingston, this town was part of Tulare County until a bridge replaced the ferry in 1873, and the town went into decline and was abandoned.

Annex A: Unincorporated Kings County

A few small settlements followed the initial settlement at Kingston, but the first incorporated community was Lemoore, first surveyed in 1872. The Southern Pacific railroad arrived in the town in 1877, and the second permanent community began along the railroad tracks shortly after its arrival. Named for James Madison Hanford, the paymaster of the Southern Pacific, the second town was incorporated in 1891. Hanford became the county seat two years later, when Kings County was formed from the western half of Tulare County.

The early economy of the county centered on ranching and farming. The first vineyard was established in 1890 and the first dairy came three years later. Settlement in Kings County remained modest throughout much of the county's first century. The third incorporated community, Corcoran, was established along the San Francisco and San Joaquin Railroad in 1905. In 1929, the fourth incorporated town, Avenal, was established on the west side of the county following the discovery of oil in the hills.

Economy

Kings County is among the largest producing agricultural counties in California (ranked 12th out of 58 counties) with a total of 617,030 acres in agricultural production (City of Hanford 2002). The gross value of all crops in the county exceeded \$1.4 billion in 2005, which represented a 9 percent increase over 2004. The county's leading commodity is milk. The remaining top 10 products are cotton, cattle, pistachios, alfalfa, tomatoes, corn silage, peaches, almonds, and walnuts (Kings County 2005).

Although Kings County is a top agricultural producer in the state, this industry does not provide the greatest number of jobs in the county. According to the U.S. Bureau of Economic Analysis, the industry with the greatest level of employment in 2004 was state and local government, which provided 10,763 jobs. Avenal and Corcoran State Prisons are large contributors to this number. Other top employment industries are military (7,248 jobs), farm employment (6,348 jobs), and retail trade (4,990 jobs). The top nongovernmental employers in the county are Del Monte Foods (1,400 employees) and J.G. Boswell Company (1,200 employees) (Kings County Economic Development Corporation 2006).

Population

The total estimated county population in 2006 was 147,729 people. Population estimates for the unincorporated areas from the 2000 U.S. Census are included in the table below.

Table A.1. Unincorporated Kings County Population, 2000 U.S. Census

Community	Population
Armona	3,239
Home Garden	1,702
Kettleman City	1,499
Stratford	1,264
Unincorporated Total	34,300

HAZARD IDENTIFICATION

The planning team for Kings County identified hazards that affect the county and developed hazard profiles based upon the countywide risk assessment and past events and their impacts. Definitions for the rankings used can be found in Chapter 3: Risk Assessment.

Table A.2: Unincorporated Kings County—Hazard Profiles

Hazard	Probability of Occurrence	Spatial Extent	Potential Magnitude	Significance
Dam Failure	Unlikely	Extensive	Catastrophic	Low
Drought	Occasional	Extensive	Critical to Catastrophic	High
Earthquake	Occasional	Significant	Critical	High
Extreme Heat	Highly Likely	Extensive	Limited	Medium
Flood	Likely	Significant	Critical	Medium
Fog	Highly Likely	Significant	Limited	Medium
Freeze	Likely	Significant	Limited	Medium
Landslide	Occasional	Limited	Negligible	Low
Soil Hazards: Expansive Liquefaction Erosion	Unlikely	Limited	Negligible	Low
Tornado	Occasional	Limited	Negligible	Low
Wildfire	Likely	Limited	Critical	Medium

Past Events

Information on past events was provided in Sections 3.1 and 3.2, Hazard Identification and Hazard Profiles.

VULNERABILITY ASSESSMENT

The vulnerability assessment analyzes the population, property, and other assets at risk to natural hazards. This section lists assets at risk to natural hazards, including critical facilities and infrastructure; historic, cultural, and natural resources; and economic assets. It discusses the impacts that occurred in past events and vulnerability to specific hazards ranked of medium or high significance.

Asset Inventory

The table that follows lists the critical facilities and other community assets identified by the county's planning team as important to protect in the event of a disaster.

Annex A: Unincorporated Kings County

Table A.3: Unincorporated Kings County—Critical Facilities and Community Assets

Facility	Replacement Value	Occupancy/Capacity
Kings County Government Center	\$89,800,000	
Kings County Historic Courthouse	Priceless	
Kings County Corporation Yard		
Kings County Fairgrounds		
Armona Fire Station No. 5	\$1,630,000	
Corcoran Fire Station No. 11	\$1,500,000	
Stratford Fire Station No. 10	\$1,250,000	
Avenal Fire Station No. 12	\$985,000	
Kettleman City Fire Station No. 9	\$1,290,000	
South Lemoore Fire Station No. 7	\$1,180,000	
Island Fire Station No. 6 (Lemoore)	\$1,050,000	
Hardwick Fire Station No. 2 (Hanford)	\$1,270,000	
Burris Park Fire Station No. 1 (Kingsburg)	\$1,350,000	
Kings County Health Department-Hanford Clinic	Unknown	
Kings County Health Department-Lemoore Clinic	\$1,075,000	
Kings County Health Department-Avenal Clinic	\$1,075,000	
Kings County Health Department-Corcoran Clinic	\$850,000	
Kings County Health Department-Kettleman Clinic	\$895,000	
Kings View Center – Medical Clinic	\$5,500,000	
San Joaquin Valley Railroad		
Burlington Northern Santa Fe Railroad		
Kettleman Hills Community Center		
Palace Indian Gaming Center		
Chemical Waste Management		
Kettleman City Wastewater Treatment		
Kettleman City CSD Office and Water		
Stratford PUD Wastewater Treatment		
Stratford PUD Water Well		
Stratford PUD Water Well		
Stratford PUD Office		
Kettleman City CSD Water		
Kettleman City CSD Water		
Home Garden CSD Water Well		
Home Garden CSD Office		
Home Garden CSD Water Well		
Power Stations		
Substation - Kettleman Hills		
Substation - Chevron Pipeline Kettleman		
Substation - Tulare Lake		
Substation - Henrietta		

Annex A: Unincorporated Kings County

Facility	Replacement Value	Occupancy/ Capacity
Substation - Angiola		
Substation - Jacobs Corner		
Substation - Guernsey		
Substation - Contadina		
Substation - Armstrong		
Substation - Reserce Oil		
Substation - Quebec Corcoran Prison		
Substation - Boswell		
Substation - Hardwick		
Pumping Plant - Las Perillas		
Pumping Plant - Badger Hill		
Power Switching Station - Armstrong		
Schools		
College of the Sequoias (Armona)		
Shelly Baird School		
JC Montgomery School		
Kings Community School		
Stratford Elementary		
Adelante Continuation (Kettleman City)		
Kettleman City Elementary		
Armona Elementary		
Armona Union Elementary		
Parkview Middle School		
Armona Union Academy		

* Community Services District (CSD); Public Utilities District (PUD)
 **Armona CSD assets are included in Section 6.6.

More information on critical facilities in the county, including the California Aqueduct, the Kettleman Hills Hazardous Waste Facility, and the Lemoore Naval Air Station can be found in Section 3.3 Vulnerability Assessment. The vulnerability assessment also provides information on the county’s natural, historical, and cultural assets; economic assets; and social vulnerability to hazards. The assessment indicates that some of the unincorporated areas of the county are the most socially vulnerable in the county. Poverty is higher, particularly in Kettleman City and Home Garden. There is also a higher percentage of the population under the age of 18 and a higher percentage of ethnic origin that may be non-English speaking.

Estimating Potential Losses

Table A.4 shows the total exposure to hazards in unincorporated areas in Kings County in terms of population and the number and values of structures. Kings County Assessor’s data was used to calculate the improved value of parcels. GIS was used to quantify the number and value of structures the 100-year (Zone A) and 500-year (X-500) floodplains and in very high wildfire

Annex A: Unincorporated Kings County

hazard areas. More information on how these estimates were calculated can be found in Section 3.3 Vulnerability Assessment.

Table A.4: Unincorporated Kings County—Exposure to Hazards

Unincorporated Areas	Population	Structures	Value
Total Exposure (Earthquake)	35,496	9,707	\$1,028,530,819
Flood: Zone A		698	\$70,358,146
Flood: X-500		1,126	\$103,977,950
Wildfire: Very High Hazard		284	\$309,063

Source: Kings County Assessor's data, FEMA Q3, and AMEC.

Impacts of past events and vulnerability to specific hazards are summarized below.

Drought

Groundwater resources in the county are in a draw down scenario even during wet years. On average, the water table in the Tulare Lake sub-basin declined nearly 17 feet from 1970 through 2000 (California Groundwater Bulletin 2006). Resulting land subsidence can result in decreased availability of water from aquifers. Population growth is one of most important issues affecting local water resources management in Kings County.

Earthquake

The earthquake hazard in Kings County is most critical for western communities. The HAZUS data presented in Section 3.3 predicts estimated losses countywide for all jurisdictions for two different earthquake scenarios. The model predicts building losses will be highest in manufactured housing, which may be an important consideration for the county's housing rehabilitation programs in unincorporated areas.

Most of Kings County east of Interstate 5 and west of the railroad are mapped as having liquefaction potential. There are less than 10 unreinforced masonry buildings in the unincorporated county and none of these exist within in Seismic Zone 4.

Extreme Heat

On average, there are over 100 days, when temperatures reach 90°F, per year throughout the county. In 2006, temperatures greater than 100 degrees occurred over a seven-day period. Livestock were most severely impacted by the prolonged heat, which created a problem with carcass disposal. To address human health issues, the county opened cooling centers for citizens.

Flood

According to FEMA's Flood Insurance Study (1988), flooding in Kings County is characterized by sheetflow and ponding to shallow depths. The average flooding season occurs from November through June, with the rainy season occurring between November and April, and snowmelt occurring from April to June. See the flood hazard profile in Section 3.2 for more information on past flooding in Kings County and a map of flood hazards in the county.

Annex A: Unincorporated Kings County

Near the unincorporated communities in Kings County, flood hazards are mapped to the east of Kettleman City and to the northwest of Stratford. In terms of economic assets, most dairy facilities are not located in flood hazard areas, except for a few in the Cross Creek floodplain in the northeastern part of the county. The Paramount Pomegranate Orchards are located in a mapped flood hazard area near the southern border of the county.

In the mapped flood hazard area of the Tulare Lake basin, the improved parcel data indicates that there is approximately \$36 million in total structural value exposed, in addition to the value of the crops cultivated in this area. Flooding in 1996 required the intentional breach of levees to divert floodwater to the Tulare Lake basin.

There are 144 National Flood Insurance Program (NFIP) policies in unincorporated Kings County and there have been four claims totalling \$16,699.81. There are no repetitive loss properties in the county. A Flood Insurance Study and a Flood Insurance Rate Map were completed in 1988, when the county joined the NFIP. Flood Insurance Rate Maps are in the process of being digitally updated and should be available in 2007.

Fog

Fog creates dangerous conditions countywide, occurring primarily between December and March. It is primarily a traffic and life-safety issues. The impacts are the same as those described in Chapter 3: Risk Assessment.

Wildfire

Most wildfires that occur in the county are characterized by dry, flashy fuels and are suppressed by the Kings County Fire Department. Wildfire-urban interface areas occur primarily in the southwestern part of the county near Avenal. Most of the high threat area occurs west of Interstate 5 and very high threat areas are west of Highway 33, which is primarily a state responsibility area for fire protection. A very high fire threat area is mapped along the Fresno County boundary and near Avenal's city boundary along Highway 269. Except for the Braley-Jones Ranch fire in 1951 near Stratford, all other mapped fires occurred west of Interstate 5. The largest was the Skyline fire in 1996, which burned over 20,000 acres along the west side of Interstate 5, north of Highway 41 and east of Avenal.

Other Hazards

Freezes typically affect orchards or crops, which have led to past disaster declarations. These events are similar countywide and are described in Chapter 3: Risk Assessment. Steep ranges in the southwest part of the county are the most prone to wildfire and to landslides and other slope failures. However, these are in remote, isolated areas and pose little threat to people or property. Although, some parts of the county are subject to soil subsidence or liquefaction, the Hazard Mitigation Planning Committee (HMPC) reports that there are few impacts. These hazards are most common in high ground water areas north and south of Lemoore. Small tornados occur on the valley floor occasionally, in the past there has been some limited damage to buildings.

Future Development Trends

Kings County has grown at an average rate of 2.3 percent per year since the 2000 U.S. Census, and is projected to continue growing to a population of 198,700 in the year 2020 (California Department of Finance 2006).

Policies in the Kings County General Plan direct urban growth to the four incorporated cities and the four unincorporated communities of Armona, Home Garden, Kettleman City, and Stratford. Of the unincorporated communities, Home Garden is close to completely developed and Stratford is nearing development capacity. These areas are not likely to develop much further in the near future. Additional residential growth is likely to occur in Armona; however, the community is an area of lower vulnerability to natural hazards. Kettleman City is the community with the greatest potential for substantial growth, particularly if a new water system is developed in the near future. This community is located within Seismic Zone 4 and in an area identified as having liquefaction potential.

A new project, the Quay Valley Ranch, proposes the development of approximately 12,000 acres of agricultural and other open space land into a new community. The proposed project would include residential, commercial, light industrial, and recreational/visitor-serving land uses. The proposed site is located in a strip of land from near the Kern County border to Utica Avenue.

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. The capability assessment is divided into five sections: regulatory, administrative and technical, fiscal, outreach and partnerships, and other mitigation efforts.

Regulatory Capability

Table A.5 lists planning and land management tools typically used by local and tribal jurisdictions to implement hazard mitigation activities and indicates those that are in place in Kings County.

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Table A.5: Unincorporated Kings County—Regulatory and Planning Capabilities

Regulatory Tool	Yes/No	Comments
General plan	Yes	1993. Currently being updated
Zoning ordinance	Yes	Adopted 1964, last amended 2003
Subdivision ordinance	Yes	2001
Site plan review requirements	Yes	
Growth management ordinance	No	
Floodplain ordinance	Yes	Flood Damage Prevention Ordinance, 1989
Other special purpose ordinance (stormwater, steep slope, wildfire)	No	Fire Prevention and Protection Ordinance
Building code	Yes	Version: 2001 California Building Code
Fire department ISO rating	Yes	Rating: 4
Erosion or sediment control program	No	
Stormwater management program	No	Draft plan
Capital improvements plan	Yes	Draft 10-year plan
Economic development plan	Yes	Kings County Economic Development Corporation
Local emergency operations plan	Yes	2002, currently being updated

Kings County General Plan, 1993 - The General Plan was originally adopted in 1993 and includes several subsequent amendments. The purpose of the plan is to guide the physical growth of the unincorporated portion of Kings County and the conservation of its resources through the year 2005 in a manner consistent with the goals of the people. The county is currently updating the General Plan.

The purpose of the Safety Element is to minimize loss of life and property in the event of a natural or manmade catastrophe. Policies are intended to prevent construction that would fail during such an event and to minimize associated personal and financial suffering. Mitigation-related goals of the Safety Element are summarized below:

Goal 36: Minimize loss of life and personal property caused by geologic hazards.

Objective 36.1: Regulate new construction to achieve acceptable levels of risk posed by geologic hazards.

- Policy 36a: Prevent structural failure caused by ground shaking and other geologic hazards by adopting the latest version of the Uniform Building Code.
- Policy 36b: Consider seismic hazards in the environmental review process. Include landslides, subsidence, liquefaction, flooding, local soils, and geologic conditions.
- Policy 36c: To further reduce possible damage in case of earthquake, require open space land uses in areas identified for hazardous activities.
- Policy 36d: Use the Uniform Code for the Abatement of Dangerous Buildings and the Uniform Housing Code to further assure safe construction and rehabilitation.

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- Policy 36e: Prohibit new construction directly astride known faults or fault zones. Allow only nonstructural land uses in such zones.

Goal 37: Prevent unnecessary exposure of people and property to injury from fire.

Objective 37.1: Regulate new development to reduce the risk of damage and injury due to fire.

- Policy 37a: Refer proposed development and code revisions to the Kings County Fire Department for review and comment.
- Policy 37b: Use the Uniform Code for the Abatement of Dangerous Buildings, and the Uniform Housing Code, to further assure safe construction and rehabilitation.

Goal 38: Prevent unnecessary exposure of people and property to flood damage.

Objective 38.1 Regulate new development to reduce the risk of flood damage to an acceptable level.

- Policy 38a: Incorporate FEMA maps and data into the land use planning and development review processes. Reserve FEMA- designated flood hazard areas for agricultural uses and zone them for open space and agricultural purposes.
- Policy 38b: Regulate development, water diversion, vegetation removal, and grading to minimize any increase in flood damage to people and property.
- Policy 38c: Require developers to pay the cost of drainage facilities to handle surface runoff from new development.
- Policy 38d: Require that tentative and final subdivision maps and approved site plans show areas subject to flooding.
- Policy 38e: Enforce and maintain Chapter 5A of the Kings County Code of Ordinances (Flood Damage Prevention).

Kings County, 2002 - The Emergency Operations Plan addresses the planned response to emergency situations associated with natural disasters, technological incidents, and national security emergencies in or affecting Kings County. The plan establishes the emergency management organization required to mitigate any significant emergency or disaster affecting Kings County; identifies the policies, responsibilities, and procedures required to protect the health and safety of communities, public and private property, and the environmental effects of natural and technological emergencies and disasters; and establishes the operational concepts and procedures associated with Initial Response Operations (field response), the Extended Response Operations (Emergency Operations Center activities), and the recovery process. This plan is currently being updated through a process closely integrated with the mitigation plan and should be completed in 2008.

California Division of Forestry and Fire Protection (CDF) Fresno-Kings Unit Pre-Fire Management Plan, 2005 – The CDF has primary responsibility for fire protection for over 923,000 acres of direct protection lands in the Fresno-Kings Unit. Most of this area is in Fresno

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County. In Kings County, CDF direct protection areas are west of Highway 33. The pre-fire management plan assesses level of service, assets at risk, fuels, and weather to evaluate wildfire risk in the Fresno-Kings Unit. Priority areas and projects are identified for each battalion unit.

Emergency Services Ordinance, 1975 and 1982 - The purposes of this ordinance are to provide for the preparation and implementation of plans for the protection of people and property within the county in the event of an emergency; the direction of the emergency organization; and the coordination of the emergency functions of this county with the cities in the county and with all other public agencies, corporations, organizations, and affected private persons. The ordinance establishes the Kings Area Disaster Council and designates the membership of the council. Membership includes one member of the Kings County Board of Supervisors (director of emergency services), the assistant director of emergency services, a member of the city council from each of the cities, the emergency manager from each of the cities, and one member at large. The council's powers include the development of emergency and mutual aid plans and agreements and the ordinances and resolutions to implement them.

Fire Prevention and Protection Ordinance Section 10-16 and 10-17 – Requires every person with land or a building or structure upon land within the unincorporated area of the county, which has vegetation that is flammable or easily ignited and is adjacent to farming lands having flammable vegetation or a highway, maintain an effective fire break of at least 20 feet in width on the outer boundary of the lands and/or around the building during fire season.

Flood Damage Prevention Ordinance, 1989 - The purpose of this ordinance is to promote the public health, safety, and general welfare and to minimize public and private losses due to flood conditions in specific areas by provisions designed to:

- Protect human life and health
- Minimize expenditure of public money for costly flood control projects
- Minimize the need for rescue and relief efforts associated with flooding and generally undertaken at the expense of the general public
- Minimize prolonged business interruptions
- Minimize damage to public facilities and utilities such as water and gas mains, electric, telephone and sewer lines, and streets and bridges located in areas of special flood hazard
- Help maintain a stable tax base by providing for the sound use and development of areas of special flood hazard so as to minimize future blight areas
- Assist potential buyers in identifying properties that are in areas of special flood hazard
- Promote those who occupy the areas of special flood hazard assuming responsibility for their actions

The ordinance designates methods for reducing flood losses, which are listed below. These regulations apply to special flood hazard areas mapped in FEMA's 1988 FIRM.

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- Restricting or prohibiting uses which are dangerous to health, safety, and property due to water or erosion hazards or that result in damaging increases in erosion or in flood heights or velocities
- Requiring that uses vulnerable to floods, including facilities which serve such uses, be protected against flood damage at the time of initial construction
- Controlling the alteration of natural floodplains, stream channels and natural protective barriers that help accommodate or channel floodwaters
- Controlling such filling, grading, dredging, and other development which may increase flood damage
- Preventing or regulating the construction of flood barriers which will unnaturally divert floodwaters or which may increase flood hazards in other areas.

The county is in the process of completing a NFIP Community Rating System review. The resulting reports will recommend ways that the county could reduce flood risk and achieve higher Community Rating System ratings, which would reduce flood insurance premiums for local policyholders. Any mitigation actions resulting from these reports will be added to the plan in the future.

Natural Resources and Conservation District - This district is intended primarily for application to rural and urban areas of the county where it is necessary and desirable to provide permanent open spaces to protect natural watercourses, drainage basins, and sloughs, which are necessary to safeguard the health, safety, and welfare of the people. Permitted uses in this zone include flood control channels, water pumping stations and reservoirs, irrigation ditches and canals, and ditch and canal rights-of-way, settling and water conservation recharging basins and parkways, and recreation areas, parks, playgrounds.

Administrative and Technical Capability

The table below identifies the county personnel responsible for activities related to mitigation and loss prevention in Kings County. Many positions are part time or filled by the same person. A summary of technical resources follows.

Table A.6: Unincorporated Kings County —Personnel Capabilities

Personnel Resources	Department/Position
Planner/engineer with knowledge of land development/land management practices	County Planning Agency/Senior planner
Engineer/professional trained in construction practices related to buildings and/or infrastructure	County Planning Agency/Chief Building Inspector
Full time building official	County Planning Agency/Chief Building Inspector
Floodplain manager	County Planning Agency/Chief Building Inspector
Emergency manager	County Emergency Services/Director, Coordinator
Grant writer	No
Other	Office of Administration, Sheriff's Office, and Public Works Department

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In the past, knowledgeable staff at the California Department of Conservation has assisted county staff in understanding natural hazards. The Kings County Planning Agency has a part-time GIS coordinator, who assists the cities and districts in the county with GIS data needs. Another technical capability is the Emergency Alert System public warning system operated by the Kings County Sheriff's Office.

Fiscal Capability

The following table identifies financial tools or resources that the county could potentially use to help fund mitigation activities. There are currently no specific funding sources for hazard mitigation.

Table A.7: Unincorporated Kings County —Available Financial Tools and Resources

Financial Resources	Accessible/ Eligible to Use	Comments
Community Development Block Grants	Yes	Planning Agency administers program
Capital improvements project funding	Yes	State and federal funding channelled through Kings County Association of Governments
Authority to levy taxes for specific purposes	Yes	Must be approved by voters
Fees for water, sewer, gas, or electric services	No	Services provided through cities or districts and levied through property assessments
Impact fees for new development	Yes	Adopted development impact fees for law enforcement and fire
Incur debt through general obligation bonds	Yes	
Incur debt through special tax bonds	Yes	Requires approval by two-thirds of voters
Incur debt through private activities	Yes	Do not have any in place
Withhold spending in hazard prone areas	No	

Outreach and Partnerships

The Kings County Fire Department provides education and outreach on earthquake and fire safety. Other county departments with education programs include the Sheriff's Office, Agricultural Commissioner, and the Department of Public Health.

The "Are You Okay?" program is a free computerized telephone system provided by the Kings County Sheriff's Office to check on senior citizens or disabled/homebound individuals. It is available in the cities of Corcoran, Hanford, and Lemoore. This program could be enhanced to check on these vulnerable populations during extreme temperature events.

The Kings County Economic Development Commission meets regularly and works with the cities, county, state, utilities, existing businesses, financial institutions, and other interested parties to ensure that economic development programs are meeting community goals. The commission works to create job opportunities and to increase the bottom line for business through development and retention assistance. The commission could be an important partner

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in outreach efforts to educate businesses about mitigation and emergency preparedness and in economic recovery planning.

The Kings County Association of Governments was created in 1967 as a voluntary association of governments to provide a cooperative body for the resolution of issues that go beyond established jurisdictional boundaries. The association exchanges planning information between member agencies related to planned area wide development with emphasis on transportation; identifies and studies problems in areas of urban growth affecting various agencies; considers questions of mutual concern to the county, cities, and other agencies and makes recommendations on an advisory basis; provides for citizen involvement in the planning process; provides technical services to the member agencies; and operates as the regional transportation planning agency.

SUMMARY OF KEY ISSUES AND RISK

The summary of countywide risks can be found at the conclusion of Chapter 3.

GOALS AND OBJECTIVES

Kings County adopts the hazard mitigation goals and objectives developed by the HMPC and described in Chapter 4.

MITIGATION ACTIONS

The planning team for the unincorporated areas of the county identified and prioritized the following mitigation actions based on the risk assessment. Background information as well as information on how the action will be implemented and administered, such as ideas for implementation, responsible office, partners, potential funding, estimated cost, and timeline also are described.

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Mitigation Action: Kings County #1—Long-Term Water Supply

Action:	Improve coordination, planning, and investment in long-term water supplies to meet demands of ongoing growth and development.
Jurisdiction:	Multi-Jurisdictional
Priority:	High
Issue/Background:	Counties within the central and southern San Joaquin Valley region are experiencing tremendous growth as a result of low land costs, affordable housing, and low mortgage interest rates. This growth surge along with depleting surface and ground water supplies and projected outlook of global warming may severely cripple the available water supplies to Kings County during years of drought. Other regions are currently working on regional water management plans to receive bond funds for water capacity building projects.
Ideas for Implementation:	The Kings County Water District has attempted to coordinate proactive water capacity building programs and projects to address the future needs of the county's agricultural, rural, and urban water needs. This effort should be built upon to develop a water management plan that covers Kings County. The plan should incorporate a countywide strategy for conservation programs, recycled water reuse programs, programs that build additional recharge and storage, and policies that work to retain existing surface water rights within the county for future use. The Kings County portion of the San Joaquin Valley Regional Blueprint may provide an appropriate avenue to address this planning effort.
Responsible Office:	Kings County Planning Agency to take the lead until another more appropriate agency or joint powers authority can take over
Partners:	Cities of Avenal, Corcoran, Lemoore, and Hanford; special districts; water and irrigation districts; Local Agency Formation Commission of Kings County; and Kings County Association of Governments
Potential Funding:	Possible grant and bond funds through recent State Propositions.
Cost Estimate:	\$60,000 to \$80,000 for a countywide water capacity study and \$10,000 to \$45,000 for jurisdiction implementation of planning policy recommendations.
Benefits: (Losses Avoided)	\$1000s in potential agricultural and other resource losses avoided over the long term during years of severe drought. \$1000s in the reduction of emergency responses and recovery supplies for cities and communities unprepared and left without adequate water supplies for their residents.
Timeline:	Countywide water management plan to be completed in three years, then ongoing efforts
Completed by:	Greg Gatzka, Kings County Planning Agency, Deputy Planning Director and GIS Coordinator

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Mitigation Action: Kings County #2—Interjurisdictional GIS Program

Action:	Enhance existing centralized, interjurisdictional GIS program to improve capabilities in mitigation, preparedness, and response for all hazards.
Jurisdiction:	Multi-Jurisdictional
Priority:	High
Issue/Background:	Access to current and updated GIS information is critical to effective evaluation, mitigation, and response to emergencies by all jurisdictions. This resource is already well-established in the Kings County Planning Agency and should be built upon and extended to more agencies in the county. It could be enhanced for multiple hazards.
Ideas for Implementation:	The Kings County Planning Agency already maintains countywide GIS data and is sharing information resources with city planning departments. A centralized GIS program would connect first responding agencies with uniform data and would prioritize the development of critical information layers. A web-based mapping application could be developed to provide public information and restricted first responder information.
Responsible Office:	Kings County Planning Agency – GIS Services Division
Partners:	Cities of Avenal, Corcoran, Lemoore, and Hanford and special districts
Potential Funding:	Cities and Kings County General Fund
Cost Estimate:	\$20,000 for all four cities to contract with county GIS services in fiscal year 2007-2008. \$25,000 for web application and \$3,000 annual maintenance. \$50,000-\$100,000 every three years for data resources updates.
Benefits: (Losses Avoided)	\$1000s in potential losses avoided over the long term through enhanced, more accurate information and improved accessibility and coordination. Saves jurisdictions money by pooling resources.
Timeline:	Establish GIS support agreement with cities in fiscal year 2007-2008. Aerial imagery update in summer 2007. Web application in fiscal year 2007-2008.
Completed by:	Greg Gatzka, Kings County Planning Agency, Deputy Planning Director and GIS Coordinator

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Mitigation Action: Kings County #3—Assessment of Critical Infrastructure

Action:	Assess vulnerability of critical infrastructure and lifeline utilities, including water distribution systems, to identify and prioritize projects for multi-hazard risk reduction.
Jurisdiction:	Kings County
Priority:	High
Issue/Background:	Cities and community service districts within the county are responsible for providing necessary daily services such as water, sewer, and storm drainage to residents. Urban growth pressures in the county have increased service demands from these systems, and older portions are falling under disrepair. The collapsed city water well in Corcoran in 2006 demonstrated how vulnerable an entire community is when these services are no longer functioning and must rely upon outside assistance to provide. Older portions of the cities and communities also have deteriorated infrastructure, which are vulnerable during hazard events.
Ideas for Implementation:	Incorporate an assessment of service infrastructure into the state mandated Municipal Service Reviews (MSRs) required for all community service districts. MSRs and district spheres of influence boundaries are required to be completed by the end of 2007. The Local Agency Formation Commission (LAFCO) would use this information to more closely review system expansions. These assessments can also then be incorporated into the county's community planning efforts to identify and prioritize needed infrastructure improvements or enhancements to reduce the vulnerability of crucial infrastructure from natural hazard risk.
Responsible Office:	LAFCO of Kings County
Partners:	Kings County Planning Agency and community service districts and public utility district.
Potential Funding:	Kings County General Fund for community planning efforts and LAFCO funds for preparation of state mandated MSRs.
Cost Estimate:	\$3,000 to \$10,000 for each of the four unincorporated communities.
Benefits: (Losses Avoided)	Strategic prioritization of capital improvement efforts to increase the effectiveness of infrastructure improvements. Ensure that existing infrastructure needs are taken into account when growth or expansion of systems is proposed. Potential savings of \$1000s of piecemeal improvements and unplanned emergency response.
Timeline:	Completed by the end of calendar year 2007 to coincide with the completion of the county's four unincorporated community planning projects and LAFCO's Municipal Service Reviews.
Completed by:	Greg Gatzka, Kings County Planning Agency, Deputy Planning Director and GIS Coordinator

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Mitigation Action: Kings County #4—Kings County Area Disaster Council

Action:	Review and update items related to the Kings County Area Disaster Council in the Kings County Emergency Services Ordinance to improve countywide coordination and the monitoring and implementation of the mitigation plan.
Jurisdiction:	Kings County
Priority:	High
Issue/Background:	<p>The emergency services ordinance establishes the Kings Area Disaster Council and designates the membership of the council. Membership includes one member of the Kings County Board of Supervisors (director of emergency services), the assistant director of emergency services, a member of the city council from each of the cities, the emergency manager from each of the cities, and one member at large. The council's powers include the development of emergency and mutual aid plans and agreements and the ordinances and resolutions to implement them.</p> <p>The ordinance requires that the Disaster Council meets regularly, however in recent years the council has failed to meet. The county does not have any other interjurisdictional entity that meets regularly to coordinate emergency management and mitigation issues.</p>
Ideas for Implementation:	Review ordinance and work with cities to determine whether the requirements for the Kings County Disaster Council membership and responsibilities should be updated to better reflect future conditions. Decisions about the council's role in monitoring, maintaining, and updating the countywide hazard mitigation plan and the emergency operations plan should be included, as well as information on how the council will intersect with or replace the Hazard Mitigation Planning Committee formed for this planning process.
Responsible Office:	Kings County Office of Emergency Services
Partners:	Kings County Board of Supervisors
Potential Funding:	Kings County General Fund
Cost Estimate:	Staff time/In-Kind
Benefits: (Losses Avoided)	Improved coordination among jurisdictions. Maintenance and monitoring of the hazard mitigation plan and emergency operations plan
Timeline:	Two years
Completed by:	Kings County Office of Emergency Services

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Mitigation Action: Kings County #5—Public Education Program

Action:	Develop and implement a comprehensive strategy to improve ongoing public education regarding natural hazards and risk.
Jurisdiction:	Kings County
Priority:	High
Issue/Background:	The HMPC identified the lack of public awareness about natural hazards risk and preparedness as an obstacle to reducing potential losses in the county. In addition, as various issues arise, there is a need to effectively inform the public about them.
Ideas for Implementation:	Improved information about natural hazards may be implemented into media outlets and tools already in use by the county, such as the following: 1) a media list is compiled at the County Administration Office for distribution of fax or email information; 2) the county website home page is updated, as needed, to include information on pertinent topics, such as Warming Centers, Heat Related Illness, West Nile Virus, etc.; 3) a quarterly newsletter is published to all county employees (this is put together by the Human Resources Department). The county may also work with utility districts, such as the Armona Community Services District to provide information in utility bills.
Responsible Office:	Office of County Administration
Partners:	County departments, California Office of Emergency Services, local media, special districts
Potential Funding:	Hazard Mitigation Grant Program, Pre-Disaster Mitigation Program, Kings County General Fund, In-Kind
Cost Estimate:	
Benefits: (Losses Avoided)	Provides timely, accurate information to our public, both constituents and employees. Ensures consistent information flow. Improves public awareness and education.
Timeline:	Internal newsletter is published quarterly. Media notices and news conferences are sent as needed.
Completed by:	Deb West, King County Office of Administration, Assistant County Administrative Officer

Mitigation Action: Kings County #6—Vulnerable Populations

Action:	Develop a program or system for supporting vulnerable populations during emergency events.
Jurisdiction:	Kings County
Priority:	High
Issue/Background:	<p>In the context of emergencies and disasters, the Kings County Department of Public Health has identified special needs populations or vulnerable populations as those members of our community with little or no ability to address their own preparedness, response, and recovery, as well as those people whose life's circumstances leave them needing more than what traditional emergency response agencies provide. This community includes the following:</p> <ul style="list-style-type: none">• Physically disabled (ranging from minor disabilities causing restriction of some motions or activities, to totally disabled requiring full-time attendant care for feeding, toileting, and personal care)• Mentally disabled (ranging from minor disabilities where independence and ability to function in most circumstances is retained, to no ability to safely survive independently, and attend to personal care)• Blind, visually impaired, low vision• Deaf, hearing impaired, hard-of-hearing• Medically fragile/dependent, including those dependent on life sustaining medications, such as with HIV/AIDS and diabetes, or those dependent on medications to control conditions and maintain quality of life, such as pain medications, allergy medications, seizure control medications, etc.• Medically compromised, including people with multiple chemical sensitivities or weakened immune systems, and those who cannot be in (or use) public accommodations for a variety of reasons• Frail/elderly, seniors• Ex-convicts, registered offenders, and other clients of the criminal justice system• Limited or non-English speaking, monolingual• Homeless and shelter dependent, including shelters for abused women and children <p>Although the county makes every effort to include this community into their emergency response and recovery plans, there is not a specific plan written to address the populations listed above.</p>
Ideas for Implementation:	The Kings County Department of Public Health has developed a team of local nonprofit organizations and agencies, which currently provide services to vulnerable populations. The group shall establish goals and objectives for developing community awareness regarding preparedness and planning. The Department of Public Health will use various means to ensure information is available via different venues to ensure accessibility to residents of Kings County.
Responsible Office:	Kings County Department of Public Health, Bioterrorism Department

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Partners:	Kings County Office of Emergency Services, Bioterrorism Advisory Committee, Community Volunteers
Potential Funding:	Current planning efforts are funded through California Department of Public Health, Emergency Preparedness Grant. Other funding sources are being researched
Cost Estimate:	\$15,000-\$20,000, not including impact costs for those participating in planning group
Benefits: (Losses Avoided)	Emergency planning for vulnerable populations will help reduce loss of life and injury during emergency events. Increased community awareness and planning will also be beneficial.
Timeline:	Ongoing
Completed by:	Sabrina Bustamante, Kings County Department of Public Health, Emergency Response Coordinator

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Mitigation Action: Kings County #7—Plans for Special Needs Students

Action:	Develop a plan for supporting medically fragile and special needs students at each school site during emergency events.
Jurisdiction:	Multi-Jurisdictional
Priority:	Medium
Issue/Background:	In reviewing emergency operation plans and developing the hazard mitigation plan, we have determined that we are lacking a plan to assist and sustain medically fragile and special needs students during an emergency situation. Many of these students currently have medical orders for providing medication on file with the school site, but do not have medical orders or long term health plans for a period extending beyond the school day.
Ideas for Implementation:	Kings County Office of Education and Kings County School District Nurses would develop a request for extended care orders from medical providers of medically fragile and special needs students. The nurses would develop a cover letter and a form for the physician's to complete. Parents would receive a copy of the form once it was completed by the physician. Parents would be responsible for providing medical supplies as designated by the physician.
Responsible Office:	Kings County Office of Education
Partners:	Kings County School Districts, medical providers, parents of students with special needs, Kings County Health Department
Potential Funding:	In-kind from partners
Cost Estimate:	Donated time for development of forms. Current staff time to provide information requests to medical providers and parents.
Benefits: (Losses Avoided)	Reduced risk to students' health and safety during emergency events. Protection against liability claims against school districts, health officials, and emergency responders.
Timeline:	Spring 2007, begin meeting with school district nurses. Fall 2007, discussion with medical providers and develop extended care order form. Spring 2008, begin implementation and modify as necessary. By fall 2008, have routine procedure to secure extended care orders for special needs students.
Completed by:	Tamara Ravalín, Kings County Office of Education, Assistant Superintendent

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Mitigation Action: Kings County #8—Natural Hazards Review Criteria

Action:	Implement natural hazards review criteria for new development to improve long-term loss prevention.
Jurisdiction:	Kings County
Priority:	Medium
Issue/Background:	The Kings County Multi-Hazard Mitigation Plan will be integrated into the Kings County General Plan Safety Element. However, planning documents are only as valuable as the effectiveness of their implementation to affect real change in the built environment. Implementation of the plan should involve a process by which natural hazard information is easily available and reviewable by local government staff.
Ideas for Implementation:	The Kings County Planning Agency has participated in the development of the countywide mitigation plan from the outset to ensure that a high degree of input and coordination occurred. The Planning Agency should follow through in the integration and implementation of the recommended policies and actions in the plan for reducing potential hazard-related losses throughout the county. The Planning Agency will develop a process by which new development proposals are reviewed more critically against the information and policies derived from the mitigation plan. The plan can be integrated as a major part of the County's Safety Element of the General Plan update.
Responsible Office:	Kings County Planning Agency
Partners:	Kings County Office of Emergency Services
Potential Funding:	Kings County Planning Agency operational budget can absorb this as a necessary project review component and an ongoing procedure.
Cost Estimate:	\$1,000 to \$2,000 for developing and implementing a procedure for reviewing development applications using information from the hazard mitigation plan.
Benefits: (Losses Avoided)	Potential loss reductions in the \$1000s as any new development within the county will be reviewed for natural hazard impacts.
Timeline:	Implementation would occur after the county's General Plan update is completed in 2008. Estimated implementation of natural hazard review procedure is early 2009.
Completed by:	Greg Gatzka, Kings County Planning Agency, Deputy Planning Director and GIS Coordinator

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Mitigation Action: Kings County #9—Livestock Disposal Plan

Action:	Establish a livestock disposal plan and compost team to address livestock fatality during extreme heat events.
Jurisdiction:	Kings County
Priority:	Medium
Issue/Background:	The prolonged heat wave that caused abnormally high numbers of animal mortalities in the summer of 2006 highlighted the need for a more proactive dead animal management plan, particularly in the dairy industry - a primary economic driver in Kings County. Animal deaths far exceeded the ability of the local rendering plant, which also experienced heat-related shutdowns, to accept and process carcasses in a timely manner. The end result of the declared emergency was the burial of hundreds of animal carcasses in the Chemical Waste Management landfill in the Kettleman Hills.
Ideas for Implementation:	Adopt an Emergency Action Plan for Dead Animal Management as a means to better manage animal mortalities during emergency situations, which cause abnormally high rates of death, particularly in the dairy industry. Also, establish a Kings County Mortality Intervention Team that would be available to provide technical and onsite assistance to animal facility operators on proper carcass disposal methods. Continue to work with our lawmakers to change the law preventing the composting of mammalian flesh.
Responsible Office:	Kings County Agricultural Commissioner
Partners:	Kings County Agricultural Advisory Committee, University of California at Davis Extension, Environmental Health Services, Natural Resources Conservation Service, Kings County Planning Agency
Potential Funding:	The actual costs to bury the carcasses would be the responsibility of the animal facility owner/operator.
Cost Estimate:	Costs would be dependent upon the nature and length of the extreme heat event or other declared emergency. Operation of the Mortality Intervention Team would be through the Kings County General Fund.
Benefits: (Losses Avoided)	Help prevent the need to dispose of dead animals in the Chemical Waste Management Landfill and conserve landfill capacity. Proper onsite disposal will prevent contamination of ground water.
Timeline:	The Emergency Action Plan for Dead Animal Management was approved at the meeting of the Kings County Board of Supervisors on June 5, 2007.
Completed by:	Greg Gatzka, Kings County Planning Agency, Deputy Planning Director and GIS Coordinator

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Mitigation Action: Kings County #10—Safety Element of General Plan

Action:	Integrate the hazard mitigation plan with the Safety Element of the Kings County General Plan.
Jurisdiction:	Kings County
Priority:	Medium
Issue/Background:	The Kings County Multi-Hazard Mitigation Plan evaluates and addresses the same hazards that must also be addressed in local government general plans in California. The county is currently in the process of updating their General Plan. Recognizing the potential duplication of effort over evaluation of the same issues, efforts to update the Safety Element should be conducted in coordination with the multi-hazard mitigation plan.
Ideas for Implementation:	The Kings County Planning Agency has participated in the development of the countywide mitigation plan from the outset to ensure that a high degree of input and coordination occurred. The Planning Agency should follow through in the integration and implementation of the recommended policies and actions in the plan for reducing potential hazard-related losses throughout the county. The plan can be integrated as a major part of the county's Safety Element of the General Plan update
Responsible Office:	Kings County Planning Agency
Partners:	Kings County Office of Emergency Services
Potential Funding:	Kings County General Fund for General Plan update, which is already budgeted for in FY 2006-2007 and planned for funding in FY 2007-2008.
Cost Estimate:	\$2,000 to \$3,000 for integrating the multi-hazard mitigation plan into the county's Safety Element.
Benefits: (Losses Avoided)	Provides General Plan policy direction for development activity with the county's unincorporated areas. Potential loss reductions in the \$1000s as any new development within the county will be considered within the context of the county's Safety Element.
Timeline:	Draft integration to be completed by the end of calendar year 2007 and considered in the overall county General Plan update scheduled for completion in 2008.
Completed by:	Greg Gatzka, Kings County Planning Agency, Deputy Planning Director and GIS Coordinator

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Mitigation Action: Kings County #11—Adoption of DFIRMs

Action:	Update flood damage prevention ordinance to include new FEMA digital flood insurance rate maps (DFIRMs).
Jurisdiction:	Kings County
Priority:	Medium
Issue/Background:	The county's flood damage prevention ordinance currently references a flood insurance rate map that will soon be outdated when recently completed DFIRMs are available in 2008.
Ideas for Implementation:	The county's flood damage prevention ordinance will be reviewed to ensure that it correctly references the new DFIRMs that will soon be available from FEMA. The new digital maps will be available in 2008 and can be integrated into the county's current GIS system. This updated information can then be deployed at the front public counter and at workstations for both planning and building inspection staff to use when reviewing development proposals.
Responsible Office:	Kings County Building Inspection Department
Partners:	Kings County Planning Agency, FEMA
Potential Funding:	Kings County General Fund as part of the county's General Plan update and ongoing GIS maintenance operations
Cost Estimate:	Less than \$1,000
Benefits: (Losses Avoided)	Updating the ordinance will better define the flood zone boundary lines where there are questions regarding buildings proposed for construction. This will assist county personnel in enforcement of the floodplain ordinance ensuring structures are constructed to minimize the risk of flood damage.
Timeline:	Implementation projected for late 2008
Completed by:	Carl Goff, Kings County Planning Agency, Deputy Building Official

Annex A: Unincorporated Kings County

Mitigation Action: Kings County #12—Disaster Evacuation Routes

Action:	Ensure the maintenance and enhancement of established disaster evacuation routes.
Jurisdiction:	Multi-Jurisdictional
Priority:	Low
Issue/Background:	Vehicular access to the county and its communities is connected to other outlying areas by key transportation routes, such as state highways 198, 41, and 43. Other roadways maintained by the county also provide alternative access routes. Maintenance of these key routes is critical to any emergency evacuation out of the county or emergency response entering into the county.
Ideas for Implementation:	Key evacuation routes should be identified in the Kings County Emergency Operations Plan and addressed in the Kings County General Plan Safety Element and Circulation Element. Maintenance and warranted enhancements of all county maintained roads is necessary to ensure that key access routes are in good enough condition to accommodate potential emergency demand. Maintenance and warranted enhancements of all county maintained roads is an ongoing operation of the Kings County Public Works Department.
Responsible Office:	Kings County Public Works Department
Partners:	Kings County Office of Emergency Services; Kings County Planning Agency; Cities of Avenal, Corcoran, Lemoore, and Hanford; California Department of Transportation
Potential Funding:	Gas tax, federal/state transportation funding, Kings County General Fund for staff time
Cost Estimate:	Undetermined
Benefits: (Losses Avoided)	Potential saving of lives and \$1000s in countywide loss prevention.
Timeline:	Update and coordination of evacuation information in county plans completed in 2008. Maintenance and enhancement is ongoing.
Completed by:	Kevin McAlister, Kings County Public Works, Chief Engineer

Annex A: Unincorporated Kings County

Mitigation Action: Kings County #13—Traffic Safety for Fog Events

Action:	Improve lighting and traffic controls at critical intersections and roadways to improve safety during fog events.
Jurisdiction:	Multi-Jurisdictional
Priority:	Low
Issue/Background:	There is concern about fog-related traffic safety issues that usually occur during a few months in the fall. Fog-related traffic accidents may occasionally occur due to fast speeds or reduced awareness. The annual fog conditions will continue to exist in the San Joaquin Valley floor and therefore potentially result in the loss of life and property.
Ideas for Implementation:	The only cost-effective method of improving traffic safety during fog events is to increase education and enforcement. The California Highway Patrol already handles highway and county roadway traffic enforcement and paces traffic along major highways during times of severe fog. Improved lighting or traffic controls along the highways and major arterial streets is considered by California Department of Transportation and city public works departments based upon traffic accident and fatality reports. Increased awareness and education should occur through the media to remind motorists of the reduced visibility and need to slow their travel speeds down.
Responsible Office:	Kings County Public Works
Partners:	Kings County Sheriff's Department; law enforcement agencies and public works department in each city, California Highway Patrol, California Department of Transportation
Potential Funding:	Potential funding sources have not yet been identified.
Cost Estimate:	Cannot be determined as needed improvements are discovered through ongoing monitoring of fog-related accidents and their frequency
Benefits: (Losses Avoided)	Reduced traffic accidents and injuries due to fog events
Timeline:	Efforts are ongoing with responsible agencies reviewing traffic accident data and monitoring weather conditions.
Completed by:	Kevin McAlister, Kings County Public Works, Chief Engineer

Annex A: Unincorporated Kings County

Mitigation Action: Kings County #14—Updated Building Code

Action:	Adopt the 2006 International Building Code
Jurisdiction:	Kings County
Priority:	Low
Issue/Background:	Adoption of the International Building Code will help standardize building construction codes throughout the United States. This will help make construction practices and code enforcement uniform and result in better built and safer buildings.
Ideas for Implementation:	The State of California is currently going through proceedings to adopt the 2006 International Building Code. The process will require amendments to the code and it is scheduled to be adopted January 1, 2008. Once adopted at the state level, it then becomes the tool of enforcement at the local jurisdiction level.
Responsible Office:	Kings County Building Inspection Department
Partners:	Kings County Fire Department
Potential Funding:	Kings County General Fund
Cost Estimate:	Undetermined. Cost will involve training and purchases of new code books and computer assistance programs.
Benefits: (Losses Avoided)	Uniform code enforcement. Reduced risk to lives and property through safer buildings.
Timeline:	Mandatory adoption January 1, 2008
Completed by:	Carl Goff, Kings County Planning Agency, Deputy Building Official

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Mitigation Action: Kings County #15—Earthquake Hazards at Schools

Action:	Develop a plan for training school maintenance crews to identify and address nonstructural hazards in schools to mitigate earthquake risk.
Jurisdiction:	Multi-Jurisdictional
Priority:	Low
Issue/Background:	Although school districts conduct earthquake drills with students on a routine basis and follow codes to assure facilities are in proper compliance, many classrooms, offices, etc, still have bookcases and other objects which would not be stable during an earthquake.
Ideas for Implementation:	<p>Kings County Office of Education and Kings County Self-Insured Schools would develop a facility hazards check-off list and train maintenance staff in the identification of nonstructural hazards. In addition, maintenance crews would be trained on how to address and mitigate these hazards.</p> <p>Training would be conducted by the Director of Kings County Self-Insured Schools (KCSIS) in conjunction with Schools Insured Schools of California (SISC) and provided to maintenance and operations directors and chief business officials of Kings County School Districts.</p>
Responsible Office:	Kings County Office of Education
Partners:	KCSIS, SISC, Kings County School Districts
Potential Funding:	In-kind from partners
Cost Estimate:	Donated time for development of forms, training, and recordkeeping by partner agencies
Benefits: (Losses Avoided)	Reduced risk to students, staff, and school property during future seismic events. Protection against liability claims and workers compensation claims against school districts and emergency responders.
Timeline:	Summer 2007, meet with KCSIS and SISC to develop training materials. Fall 2007, provide training in conjunction with regularly scheduled trainings of maintenance directors and chief business officials. Spring 2008, begin implementation and modify as necessary. By fall 2008, have routine procedure to identify and address nonstructural hazards in schools to mitigate earthquake risk.
Completed by:	Tamara Ravalin, Kings County Office of Education, Assistant Superintendent



ANNEX B: CITY OF AVENAL

COMMUNITY PROFILE

Avenal is the smallest city in Kings County and is governed by a five-member City Council that includes the Mayor and Mayor Pro Tem.

Geography and Climate

Avenal is situated 180 miles north of Los Angeles and 200 miles south of San Francisco and Sacramento—"Half the way from the Bay to L.A." It is located in the southwestern portion of Kings County between State Route 33 and Interstate 5. Most of the developed part of the city is located in the Kettleman Plain between the Kettleman Hills to the northeast and the Kreyenhagen Hills to the southwest. The amount of land area in Avenal is approximately 19 square miles and the city's elevation is 800 feet above sea level. Annual precipitation is about 10 inches with most of the rain falling between November and April. Average high temperature in the winter is 64°F and in the summer is 98°F.

History

The city of Avenal was named by Spanish soldiers and explorers. "Avena" means oats or oat field in Spanish. The city area was originally covered with wild oats "waist high" that looked like golden silk and covered the Kettleman Plains. Early American settlers arrived in the Kettleman Hills during the 1850s to raise cattle and to farm. It was oil, however, that brought most of the people to Avenal. In 1929, Standard Oil surveyed the current site of Avenal and built the town.

During the late 1940s, the decline of oil and gas production caused Avenal's economy to weaken and many stores and houses were vacated. During the 1970s, the completion of the California Aqueduct brought in needed water, and the completion of Interstate 5 brought new business opportunities. Following incorporation in 1979, the city attracted a state prison in 1987 and later annexed the Interstate 269/Interstate 5 interchange, zoning the area for commercial and industrial development and stimulating the local economy.

Economy

Avenal is home to one of California's newest state prisons, which is the largest employer in the city with over 1,000 employees. Other major employers are Paramount Farms (600 employees) and Reef Sunset Unified School District (306 employees) (Kings County Economic Development Corporation 2006).

Population

The estimated 2006 population of Avenal was 16,349. This includes the prison population and represents an 11 percent increase over the population at the time of the 2000 U.S. Census (California Department of Finance 2006). Avenal's population is 36 percent white, 13 percent black or African American, and 47 percent "some other race." Census data indicates that 66 percent of Avenal's population is of Hispanic origin (U.S. Census Bureau 2000).

HAZARD IDENTIFICATION AND PROFILES

Avenal’s planning team identified hazards that affect the city and developed hazard profiles based upon the countywide risk assessment and past events and their impacts. Definitions for the rankings used can be found in the first section of Chapter 3.

Table B.1: City of Avenal—Hazard Profiles

Hazard	Probability of Occurrence	Spatial Extent	Potential Magnitude	Significance
Dam Failure	Unlikely	Limited	Negligible	Low
Drought	Occasional	Extensive	Critical	Medium
Earthquake	Occasional	Extensive	Critical	High
Extreme Heat	Highly Likely	Extensive	Limited	Medium
Flood	Likely	Significant	Critical	Medium
Fog	Highly Likely	Significant	Limited	Medium
Freeze	Occasional	Significant	Limited	Low
Landslide	Occasional	Limited	Critical	Low-Medium
Soil Hazards: Expansive, Liquefaction Erosion	Occasional	Significant	Limited	Low
Tornado	Unlikely	Limited	Negligible	Low
Wildfire	Occasional	Limited	Limited	Low

VULNERABILITY ASSESSMENT

The vulnerability assessment analyzes the population, property, and other assets at risk to natural hazards. This section lists Avenal’s assets at risk to natural hazards, including critical facilities and infrastructure; historic, cultural, and natural resources; and economic assets. It discusses the impacts that occurred in past events and vulnerability to specific hazards ranked of medium or high significance.

Asset Inventory

The table that follows lists the critical facilities and other community assets identified by Avenal’s planning team as important to protect in the event of a disaster.

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Table B.2: City of Avenal—Critical Facilities and other Community Assets

Facility	Replacement Value	Occupancy/Capacity
City Hall	\$820,000	20
City corporate yard/equipment	\$791,000	50+
Kings County Sheriff's Office – Avenal Substation		
Kings County Fire Station No. 12 – Avenal Emergency Operations Center		
Water treatment plants (2)	\$5,200,000	5.2 MGD
Wastewater treatment plant	\$8,200,000	2 MGD
Water storage tanks	\$6,000,000	
12-inch and 18-inch water transmission lines	\$16,000,000	16 miles of lines
Pacific Gas & Electric high pressure lines		
Chevron/JP Oil oil/gas production fields		
California Aqueduct		
Medical clinics (3)		
Avenal Senior Center		100+
Avenal Child Development Center	\$1,600,000	80+
Schools		
Avenal High School		
Sunrise High School		
Reef Sunset Middle School		
Avenal Elementary School		
Tamarack Elementary School		
Head Start Center		

There is a hospital in Avenal, but it has been closed due to problems with asbestos. The nearest hospitals are in Coalinga and in Hanford. There are three medical clinics in Avenal. There are not designated shelters, but the gym at Avenal High School is a likely facility for sheltering in an emergency event. Other assets identified by the planning team were the Avenal Historical Museum and centers of employment, including Paramount Farms, Kochergen Farms, Kochergen Composting, Mouren Farming, Hewitson Farming, and Westside Farm.

The Avenal State Prison has a capacity of 7,600 plus support staff. The prison population amounts to almost half of the city's population. The prison population skews the census data for Avenal, making it difficult to summarize social vulnerability issues. (For more information, see the Social Vulnerability section in Chapter 3). However, data does indicate that median home price is lower and poverty rate is higher in Avenal than the other cities in Kings County. Education and outreach efforts, as well as emergency response planning, will need to address the needs of low-income residents and the large Spanish-speaking population. In past emergencies, volunteers have organized spontaneously to help those with mobility issues.

Estimating Potential Losses

Table B.3 shows Avenal’s total exposure to hazards in terms of population and the number and values of structures. Kings County Assessor’s data was used to calculate the improved value of parcels. GIS was used to quantify the number and value of structures in the 100-year (Zone A) and 500-year (X-500) flood hazard areas and in very high wildfire hazard areas. More information on how these estimates were calculated can be found in the Vulnerability Assessment section in Chapter 3.

Table B.3: City of Avenal—Exposure to Hazards

Avenal	Population	Structures	Value
Total Exposure (Earthquake)	16,349	1,754	\$128,111,815
Flood: Zone A		5	\$98,033
Flood: X-500		1,393	\$80,716,733
Wildfire: Very High Threat		35	\$637,272

Source: Kings County Assessor’s data, FEMA Q3, and AMEC

Impacts of past events and vulnerability to specific hazards are summarized below.

Drought

Avenal differs from the other communities in Kings County in that it is reliant on surface water from the California Aqueduct and the Central Valley Project for drinking water. The 1987-1992 drought created a water shortage that led to a temporary building moratorium in the city. The drought also resulted in the city adopting a water conservation ordinance, which is described further in the Capability Assessment section below. The Central Valley Project Improvement Act of 1992 mandates changes in management of the Central Valley Project, particularly for the protection, restoration, and enhancement of fish and wildlife. Avenal has been affected by the Act through diversions and changes mandating no new water contracts until fish and wildlife goals are achieved and no contract renewals until completion of a programmatic environmental impact statement. These changes affect agriculture users before municipal users. Drought events can also reduce the quality of water in the aqueduct and lead to increased treatment costs.

Earthquake

The earthquake hazard in Avenal is more severe than in the other cities in the county. The potential for ground shaking ranges from 40-50% g, and it is located in Seismic Hazard Zone 4. Figure 3.2 in Chapter 3 shows the known faults, historic epicenters, and potential for ground shaking in and near Kings County. HAZUS-MH, FEMA’s loss estimation software, predicts that there will be a loss of potable water in an earthquake event in Kings County. Avenal’s transmission lines for its water source are vulnerable to ground shaking and seismically-induced landslides. The water source itself, the California Aqueduct, also may be vulnerable to damage during a seismic event.

Fortunately, soils in Avenal are not mapped as prone to liquefaction, though both the Kettleman Hills and Kreyenhagen Hills are prone to landslides. Members of Avenal’s planning team recall

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that buildings shook in the Coalinga earthquake (1983) and more recently in an earthquake that occurred two years ago (2004/2005).

There are several buildings of concern in an earthquake event. The planning team identified the following:

- Avenal City Hall
- Peck's Department Store (unreinforced masonry construction)
- Veterans' Hall
- Avenal Historical Museum

The number of unreinforced masonry buildings in the city is between five and eight. California's Unreinforced Masonry Law, SB 547, passed in 1986 requires that these buildings in Seismic Zone 4 are inventoried and retrofitted in every jurisdiction. Communities must adopt a loss reduction program and report progress to the Seismic Safety Commission. The Avenal hospital was built prior to 1951 but is currently vacant. There is a moderate amount of manufactured housing in different parts of Avenal; this building type is also more vulnerable.

Extreme Heat

Extreme heat is highly likely to occur on an annual basis in Avenal. An extreme heat event in summer 2006 caused increased energy costs and danger to outdoor workers. The city does provide information on overheating and safety to city workers.

Flood

No critical facilities are located in the mapped 100-year flood hazard area in Avenal, except for part of Highway 33. Much of the city is located in the 500-year floodplain, which is primarily affected by sheet flow flooding. Facilities located here include the fire station, medical clinic, superior court, and Avenal Elementary School. See the flood hazards map on page B-4.

Two water main lines, one 18-inch and one 12-inch, carry water from the California Aqueduct to the city through the Kettleman Hills, which are prone to slope failure and erosion during heavy rains that cause flooding. The landslide-prone areas are not inside the city limits and other types of development do not occur there; therefore, landslide is not addressed as a separate hazard. There are approximately 16 miles of water transmission lines, mainly outside the city limits. There is history of problems with these water lines during hazard events. In a rain event in March 1995, the 18-inch main line broke due to slope failure around the water line cutting off the potable water supply to Avenal for 12 days. Water had to be brought in and schools and roads were closed for a short time. Businesses were also without water resulting in economic impacts. FEMA and the California Office of Emergency Services provided Public Assistance funds for the disaster. The same line broke again on January 5, 1998, near the Old Skyline Road. Although the area of failure has been reinforced, it is likely that a similar event could occur on other parts of the line in the future.

The city has restructured most culverts in the last 10 years using general funds designated for streets and stormwater drainage. Flooding remains a problem at the intersection of Seventh

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Avenue and Highway 33; however this is an issue that needs to be addressed by the California Department of Transportation. Runoff from the Arroyo del Camino is conveyed through the city by means of channel, culverts, and storm drains. The channel exists for approximately one-half miles between the city limit and Fremont Street. Downstream of Fremont Street, the discharge can result in sheet flow flooding. Discharges from the watershed areas west of Arroyo del Camino concentrate along Highway 33 at the southwest limit of the city. The Flood Insurance Study (2000) indicates that this flow will overtop Highway 33 but not accumulate.

Wildfire

Wildfire is a greater threat to Avenal than other areas of Kings County. The Skyline fire in 1996 burned over 20,000 acres east of Avenal along the west side of Interstate 5 and north of Highway 41. The fire burned close to 36th Avenue on the north side of town. There are not a significant number of homes along the city limits in the wildland-urban interface. The Kings County Fire Department provides fire protection services to the city.

Other Hazards

Fog is not as common in Avenal as the rest of the county but does occur near the airport on the southwest side and can result in traffic accidents. There are expansive soils in the area that can cause problems with foundations. The city has been able to address this issue through recommending certain building practices where these soils exist.

Future Development Trends

From 2000 to 2006, population growth in Avenal averaged about 1.9 percent per year. Growth has been steady. One area of development is located south of the city, where there is often some flooding during wet periods. While this area is not in the mapped in the flood hazard area, the city is requiring developers to address potential flood problems through enforcing the Flood Damage Prevention Ordinance.

Table B.4 City of Avenal—Change in Population and Housing Units, 2000-2006

2000 Population	2006 Population	Percent Change	2000 Housing Units	2006 Housing Units	Percent Change
14,674	16,349	11.4%	2,061	2,251	9.2%

Source: U.S. Census Bureau, 2007.

CAPABILITY ASSESSMENT

Capabilities are the programs and polices currently in use to reduce hazard impacts or that could be used to implement hazard mitigation activities. The assessment is divided into five sections: regulatory, administrative and technical, fiscal, outreach and partnerships, and other mitigation efforts.

Regulatory Capability

Table B.5 lists planning and land management tools typically used by local and tribal jurisdictions to implement hazard mitigation activities and indicates those that are in place in Avenal.

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Table B.5: City of Avenal—Regulatory and Planning Capabilities

Regulatory Tool	Yes/No	Comments
General plan	Yes	Adopted August 11, 2005
Zoning ordinance	Yes	
Subdivision ordinance	Yes	
Site plan review requirements	Yes	
Growth management ordinance	No	
Floodplain ordinance	Yes	Flood Damage Prevention Ordinance 1995
Other special purpose ordinance (stormwater, steep slope, wildfire)	No	Water Conservation Ordinance
Building code	Yes	Version: Uniform Building Code 1998
Fire department ISO rating	Yes	Rating: 4. Kings County Fire Department
Erosion or sediment control program	No	
Stormwater management program	Yes	Stormwater Pollution Prevention Plan
Capital improvements plan	Yes	Minimal capital improvements funding for small projects
Economic development plan	No	
Local emergency operations plan	Yes	For water system only

Avenal General Plan, 2005 – The city’s general plan was updated in 2005, including the safety element. The Safety Element establishes objectives and policies and standards to ensure that there is an adequate, coordinated, and expedient response to public safety concerns. It addresses emergencies, fire protection, flooding, and public safety. Objectives and policies related to mitigation are listed below:

Objective: Reduce the potential for loss of life and property resulting from natural and manmade hazards to a minimum.

Policies and Standards:

- The city will maintain its emergency preparedness, including evacuation procedures, to address potential natural and manmade hazards. These procedures shall be developed in coordination with Kings County’s emergency operations plans.
- All new buildings shall conform to state standards set forth in the Dangerous Building Code contained in the most current edition of the Uniform Building Code.

Objective: An effective and well-trained fire department that will protect the community from fire dangers.

Policies and Standards:

- The city shall maintain a reliable water supply system that meets the fire protection needs of the community.

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- The city shall enforce the municipal code as it pertains to the abatement of fire hazards related to existing buildings, structures and weed control.
- The city shall support local, state, and federal programs designed to inform and education the public concerning fire prevention and suppression.
- The city will encourage the community to become involved in promoting state and federal fire protection programs in school and civic functions.

Objective: Protect the lives and property of residents from the hazards of flooding.

Policies and Standards:

- Consistent with federal standards, the city shall implement FEMA regulations and design guidelines to address 100-year flood events and require adequate storm drainage facilities to prevent flooding within the community.
- Through site plan review, development shall be prevented from occurring in natural drainage channels.

Objective: Adopt and implement safety standards for varying hazards.

Policies and Standards:

- Environmental Impact Reports should be required on all projects with potentially significant hazardous impacts as defined by the California Environmental Quality Act.
- It is the policy of the city to require that water supply systems be related to the size and configuration of land developments. Standards as set forth in the current subdivision ordinance shall be maintained and improved as necessary.
- Development proposals shall take into consideration required fire standards, particularly in regard to critical facilities.

Flood Damage Prevention Ordinance, 1995 - The flood damage prevention ordinance adopted in 1995 establishes areas of special flood hazard identified by FEMA in the 1988 flood insurance rate map (FIRM) and flood insurance study. However, FEMA complete an updated FIRM and flood insurance map in 2000. New digital FIRMs (DFIRMs) for all of Kings County are expected in 2008.

Avenal is currently developing an emergency operations plan in coordination with Kings County, which is expected to be completed in 2008.

Administrative and Technical Capability

The table that follows identifies the personnel resources responsible for activities related to mitigation and loss prevention in Avenal. A summary of technical resources follows.

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Table B.6: City of Avenal—Personnel Capabilities

Personnel Resources	Department/Position
Planner/Engineer with knowledge of land development/land management practices	Community Development Director
Engineer/Professional trained in construction practices related to buildings and/or infrastructure	City Engineer
Full time building official	Building Department/ Public Works Director is also Building Official/Code Enforcement Officer
Floodplain Manager	Community Development Director
Emergency Manager	City Manager
Grant writer	Community Development Director
Other	Public Works Department/One position is 50 percent water conservation officer and 50 percent code enforcement

Avenal does not have GIS capabilities within in the city staff. However, the city contracts with the Kings County Planning Agency to receive assistance with geographic data needs and mapping.

Fiscal Capability

The following table identifies financial tools or resources that the city could potentially use to help fund mitigation activities. There are currently no specific funding sources for hazard mitigation.

Table B.7: City of Avenal—Available Financial Tools and Resources

Financial Resources	Accessible/ Eligible to Use	Comments
Community Development Block Grants	Yes	
Capital improvements project funding	No	Special approval by the City Council in an emergency
Authority to levy taxes for specific purposes	No	
Fees for water, sewer, gas, or electric services	No	
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	

Outreach and Partnerships

Avenal is a member of the California Rural Water Association, an affiliate of the National Rural Water Association, a nonprofit organization of rural water and wastewater systems that provides

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training, technical assistance, and representation to public water and wastewater utilities. The city also supports the Kings County Water Education Commission, which provides water education programs for schools. The city provides information on overheating and safety to city workers as required by their risk management insurance. The Kings County Fire Department does earthquake and fire safety education outreach in the city.

Other Mitigation Efforts

Avenal has an ongoing inspection program for the city's water lines for early detection and prevention of problems due to slope failure and other damage to lines. Other mitigation projects have reduced the vulnerability of the water system to seismic events and flooding, such as the following:

- Installed check valve at pipeline failure valve at Tank No. 3 site.
- Replaced valve and installed seismic deflection joint at Tank No. 4 site.
- Reinforced slopes in area around 12-inch and 18-inch water main lines located along Old Skyline Road.

SUMMARY OF KEY ISSUES AND RISK

Avenal's risk assessment revealed a number of problem areas to be addressed in the mitigation strategy:

- Avenal is located in a high earthquake hazard area in seismic Zone 4, the highest hazard zone
- The planning team has identified historic buildings and critical facilities vulnerable to seismic ground shaking but currently does not have a program in place for unreinforced masonry buildings.
- Avenal's water transmission lines, a lifeline utility, are vulnerable to slope failure caused by rain or seismic events. The city continues to implement structural projects to mitigate risk when funding is available, but vulnerability remains high.
- The reliance on surface water increases the city's vulnerability in times of drought, which are likely to occur in the future in the planning area.
- A number of structures are located in very high wildfire hazard areas, and there is a history of wildfires in the planning area.
- Education and outreach efforts, as well as response planning, related to extreme heat and other emergency events will need to address the needs of the Spanish-speaking population and special needs populations.
- There is not a designated shelter facility.

GOALS AND OBJECTIVES

The city of Avenal adopts the hazard mitigation goals and objectives developed by the Hazard Mitigation Planning Committee (HMPC) and described in Chapter 4.

MITIGATION ACTIONS

The planning team for the city of Avenal identified and prioritized the following mitigation actions based on the risk assessment. Background information as well as information on how the action will be implemented and administered, such as ideas for implementation, responsible office, partners, potential funding, estimated cost, and timeline also are described.

Mitigation Action: Avenal #1—Housing Rehabilitation Program

Action:	Continue and enhance housing rehabilitation program.
Jurisdiction:	Avenal
Priority:	High
Issue/Background:	Avenal has many homes that are old and have health and safety issues and are not earthquake safe. The city has received funding from Community Development Block Grants, HOME, and CalHome Program to rehabilitate homes. Most homes are torn down and reconstructed to current codes.
Ideas for Implementation:	
Responsible Office:	Avenal Department of Community Development
Partners:	
Potential Funding:	Community Development Block Grants, HOME, and CalHome Program grants
Cost Estimate:	In the past, the city has spent approximately \$1.5 million each year.
Benefits: (Losses Avoided)	Serves multiple objectives. Reduces risk to people and property from earthquakes and replaces substandard housing conditions.
Timeline:	Ongoing
Completed by:	Steve Sopp, Department of Community Development, Director

Mitigation Action: Avenal #2—Vulnerability of Water Distribution System

Action:	Reduce vulnerability of water distribution system
Jurisdiction:	Avenal
Priority:	High
Issue/Background:	There are two water transmission lines that supply water to the city and Avenal State Prison (one 18-inch line and one 12-inch line). In the past, the city has encountered water leaks and movement due to earthquakes that lead to slope failure. The water leaks are due to aging of the main lines.
Ideas for Implementation:	Continue to search for funding to replace the 12-inch main line which is at least 38 years old. Engineer and replace existing valves at tank sites with earthquake valves to protect the water supply. Continue to monitor both the existing lines and document critical areas.
Responsible Office:	Avenal Public Works Department
Partners:	
Potential Funding:	Hazard Mitigation Grant Program, Pre-Disaster Mitigation Program, and other state and federal loan and grant programs
Cost Estimate:	For 12-inch line, \$1 million per mile for 7 miles total.
Benefits: (Losses Avoided)	Improves availability of water supply for residents and businesses during emergencies and helps ensure against property losses due to fires.
Timeline:	Ongoing; replace 12-inch line within five to seven years
Completed by:	Steve Sopp, Department of Community Development, Director

Mitigation Action: Avenal #3—Vulnerable Populations

Action:	Develop a program/system for supporting vulnerable populations during emergency events.
Jurisdiction:	Avenal
Priority:	Medium
Issue/Background:	The city currently does not have a plan or program for addressing the special needs of more vulnerable populations, such the elderly, handicapped, and others during an emergency event.
Ideas for Implementation:	Develop a task force to identify those that are vulnerable and their needs; document and list before any emergencies occur. Develop a plan to identify "safe" housing location(s) and plan a safe route to those locations.
Responsible Office:	City of Avenal
Partners:	Red Cross, Kings County Office of Emergency Services
Potential Funding:	Hazard Mitigation Grant Program, Pre-Disaster Mitigation Program, nonprofit organizations, Avenal General Fund, other state and federal funds
Cost Estimate:	\$50,000
Benefits: (Losses Avoided)	Provides services to the community and reduces risk to health and safety of citizens
Timeline:	Implement program within three years
Completed by:	Jerry Watson, Department of Public Works, Director and Emergency Services Deputy

Mitigation Action: Avenal #4—Loss Reduction Program for URM Buildings

Action:	Establish a loss reduction program for unreinforced masonry (URM) buildings in compliance with the California URM Law of 1986.
Jurisdiction:	Avenal
Priority:	High
Issue/Background:	<p>Most unreinforced masonry (URM) buildings possess features that can threaten lives during earthquakes. In response to the danger posed by the great number of potentially hazardous buildings in California, in 1986 the state legislature enacted the unreinforced masonry building law (Chapter 250, Statutes of 1986: SF547 [Alquist]; Government Code Section 8875 et seq.), commonly known as the "URM Law." The law is aimed at mitigating the hazards posed by URMs and applies to all jurisdictions in California's Seismic Hazard Zone 4, the region of highest earthquake activity in the nation, in which Avenal is located.</p> <p>Current city staff members estimate that there are five to eight URM buildings in Avenal. According to the 2006 Status of the Unreinforced Masonry Building Report of the California Seismic Safety Commission, Avenal has not reported a loss reduction program for URM buildings.</p>
Ideas for Implementation:	Seek approval from the City Council for developing and implementing a loss reduction program to comply with the URM Law. Inventory existing URM buildings in the city. Develop a loss reduction program, such as one of the types described in the 2006 Status of the Unreinforced Masonry Building Report. This may include letters to owners of URM buildings, signage on the front of URM buildings notifying the public of the earthquake hazard, or other types of measures. The city will report its program and future progress to the California Seismic Safety Commission.
Responsible Office:	Avenal City Manager
Partners:	California Seismic Safety Commission, Avenal City Council, Avenal Department of Public Works
Potential Funding:	In-kind, Avenal General Fund
Cost Estimate:	Staff time
Benefits: (Losses Avoided)	Increase awareness of the public and owners of URM buildings about potentially hazardous buildings. Reduce future losses in earthquake events.
Timeline:	Six months
Completed by:	Melissa Whitten, City of Avenal, City Manager

Mitigation Action: Avenal #5—Natural Hazards Review Criteria

Action:	Implement natural hazards review criteria for new development to improve long-term loss prevention.
Jurisdiction:	Avenal
Priority:	Medium
Issue/Background:	Natural hazards such as earthquakes and flooding have the potential to affect new development and create substantial injury and economic loss. Currently, the city uses FEMA flood zones to enforce floodplain management, and the Avenal General Plan requires all new buildings to conform to state standards set forth in the Dangerous Building Code contained in the most current edition of the Uniform Building Code.
Ideas for Implementation:	The city can revise its flood ordinance, research other earthquake zone criteria, and develop other review criteria for other type of hazards to ensure the safety of new development in the city.
Responsible Office:	Avenal Department of Community Development
Partners:	Kings County
Potential Funding:	In-kind, Avenal General Fund
Cost Estimate:	Unknown
Benefits: (Losses Avoided)	New development and land use will be less vulnerable to natural hazard events
Timeline:	Three years
Completed by:	Steve Sopp, Department of Community Development, Director

Annex B: City of Avenal

Mitigation Action: Avenal #6—Safety Element of General Plan

Action:	Update Safety Element of the General Plan to integrate information from the hazard mitigation plan.
Jurisdiction:	Avenal
Priority:	Medium
Issue/Background:	Once the hazard mitigation plan is complete, the Safety Element of the Avenal General Plan will need to be amended to incorporate new information and possibly new objectives, policies, and standards based on that information.
Ideas for Implementation:	A general plan amendment will take approximately four to six months to complete depending on the type of environmental review required. The Planning Commission makes a recommendation to the City Council. The Community Development Director will coordinate this amendment.
Responsible Office:	Avenal Department of Community Development
Partners:	
Potential Funding:	In-Kind, Avenal General Fund
Cost Estimate:	Staff time
Benefits: (Losses Avoided)	The amendment will insure that the General Plan Safety Element is compatible with the hazard mitigation plan.
Timeline:	Complete update within one year
Completed by:	Steve Sopp, Department of Community Development, Director

Mitigation Action: Avenal #7—Adoption of new DFIRMs

Action:	Update the floodplain management ordinance to include new FEMA digital flood insurance rate maps (DFIRMs).
Jurisdiction:	Avenal
Priority:	Medium
Issue/Background:	New FEMA digital flood maps have been developed and are expected to be available in 2008. The city's floodplain ordinance currently references older maps. Additionally, federal and state law requires changes to the city's ordinance.
Ideas for Implementation:	The city will update its ordinance as required by law. The Community Development director will oversee this process. Changes to the FEMA maps are updated with the help of the Kings County Planning Agency and their GIS program. The city has a contract with the county to provide such updates.
Responsible Office:	Avenal Department of Community Development
Partners:	
Potential Funding:	Avenal General Fund
Cost Estimate:	The contract with the County of Kings is \$5,000 per year
Benefits: (Losses Avoided)	Current floodplain ordinance and maps can improve floodplain management capabilities of the city.
Timeline:	Ordinance will be updated within six months of FEMA's approval of maps
Completed by:	Steve Sopp, Department of Community Development, Director

Mitigation Action: Avenal #8—Updated Building Codes

Action: Adopt California's updated building code to improve the disaster resistance of future buildings.

Jurisdiction: Avenal

Priority: Medium

Issue/Background: The International Building Codes are on a three-year revision cycle. The state of California reviews and modifies the codes. After the review and modifications, the state adopts the codes as required. After the state adopts the code, Avenal will also review and adopt the codes.

Ideas for Implementation:

Responsible Office: Avenal Department of Community Development

Partners: Kings County

Potential Funding: In-Kind, Avenal General Fund

Cost Estimate: \$1,000

**Benefits:
(Losses Avoided)** Reduces future losses by requiring more disaster resistant future buildings.

Timeline: Within six months of the adoption of the 2006 International Building Codes by the state of California.

Completed by: Jerry Watson, Department of Public Works, Director and Emergency Services Deputy

Mitigation Action: Avenal #9—Preserve Open Space in Floodplain

Action:	Preserve open space in the floodplain through regulatory and nonregulatory methods.
Jurisdiction:	Avenal
Priority:	Low
Issue/Background:	All of the land within the city limits on the west side of State Route 33 is located within a FEMA 100-year floodplain.
Ideas for Implementation:	The city will maintain the current zoning, Extensive Agriculture, which does not allow for commercial or residential development. If a single family home is built, it must meet FEMA flood insurance guidelines.
Responsible Office:	Avenal Department of Community Development
Partners:	Kings County, FEMA
Potential Funding:	In-Kind, Avenal General Fund
Cost Estimate:	Unknown
Benefits: (Losses Avoided)	Enforcement of the FEMA flood zone will promote wise development averting flooding of residential or commercial properties.
Timeline:	Ongoing
Completed by:	Steve Sopp, Department of Community Development, Director



ANNEX C: CITY OF CORCORAN

COMMUNITY PROFILE

The governing body of the city of Corcoran is a City Council comprised of five members. Council members are elected from the community at large to serve four-year staggered terms. The council elects the mayor every two years. The mayor is the ceremonial head of the council but has no extra legal authority different than the other four members.

Geography and Climate

Corcoran is located near the center of Kings County and encompasses approximately six square miles. The elevation of the city is 207 feet above mean sea level and the topography is generally flat. The town is located on the northeast edge of the Tulare Lakebed, and Cross Creek is located to the west of town. The average high temperature in winter is 50°F and in summer is 98°F.

History

The city of Corcoran was developed by H.J. Whitley, a prominent land developer from Southern California, who traveled to the area in 1905 and purchased 32,000 acres of land. The city's main street, Whitley Avenue, is named after him. In subsequent years, Corcoran grew rapidly with the rise of the cotton industry, attracting workers to its booming agricultural industry. The town was incorporated in 1913. The mechanization of cotton planting and harvesting caused a significant loss of jobs, residents, and economic vitality in Corcoran. The city remains a center of agriculture and J.G. Boswell Company, the nation's largest cotton producer, operates major farming operations in the city.

Economy

Corcoran State Prison (Corcoran I), completed in 1989, is the state's largest prison. The prison employs 1,900 individuals and houses 4,951 prisoners. California Substance Abuse Treatment Facility and State Prison (Corcoran II), completed in 1997, employs 1,745 individuals and houses around 7,000 prisoners. Other major employers are the Corcoran Unified School District (389 employees) and J.G. Boswell Company (375 employees) (Kings County Economic Development Corporation 2006).

Population

Corcoran's estimated population in 2006 was 23,448 (including residents at the state prisons). This represents approximately a 13 percent increase over the population at the time of the 2000 U.S. Census (California Department of Finance 2007). Corcoran's population is 34 percent white, 14 percent black or African American, and 46 percent "some other race." Census data indicates that 60 percent of Corcoran's population is of Hispanic origin (U.S. Census Bureau 2000).

HAZARD IDENTIFICATION AND PROFILES

Representatives from Corcoran identified hazards that affect the city and developed hazard profiles based upon the countywide risk assessment and past events and their impacts. Definitions for the rankings used can be found in Chapter 3: Risk Assessment.

Table C.1: City of Corcoran—Hazard Profiles

Hazard	Probability of Occurrence	Spatial Extent	Potential Magnitude	Significance
Dam Failure	Unlikely	Significant	Critical	Low
Drought	Occasional	Extensive	Critical	High
Earthquake	Occasional	Extensive	Critical	High
Extreme Heat	Highly Likely	Extensive	Limited	Medium
Flood	Likely	Limited	Critical	High
Fog	Highly Likely	Extensive	Limited	Medium
Freeze	Likely	Extensive	Limited	Low
Landslide	Unlikely	Limited	Negligible	Low
Soil Hazards: Expansive, Liquefaction, Erosion	Occasional	Significant	Limited	Low
Tornado	Occasional	Extensive	Limited	Low
Wildfire	Unlikely	Limited	Negligible	Low

VULNERABILITY ASSESSMENT

The vulnerability assessment analyzes the population, property, and other assets at risk to natural hazards. This section lists Corcoran’s assets at risk to natural hazards, including critical facilities and infrastructure; historic, cultural, and natural resources; and economic assets. It discusses the impacts that occurred in past events and vulnerability to specific hazards ranked of medium to high significance.

Asset Inventory

The table that follows lists the critical facilities and other community assets identified by Corcoran’s planning team as important to protect in the event of a disaster.

Annex C: City of Corcoran

Table C.2: City of Corcoran—Critical Facilities and other Community Assets

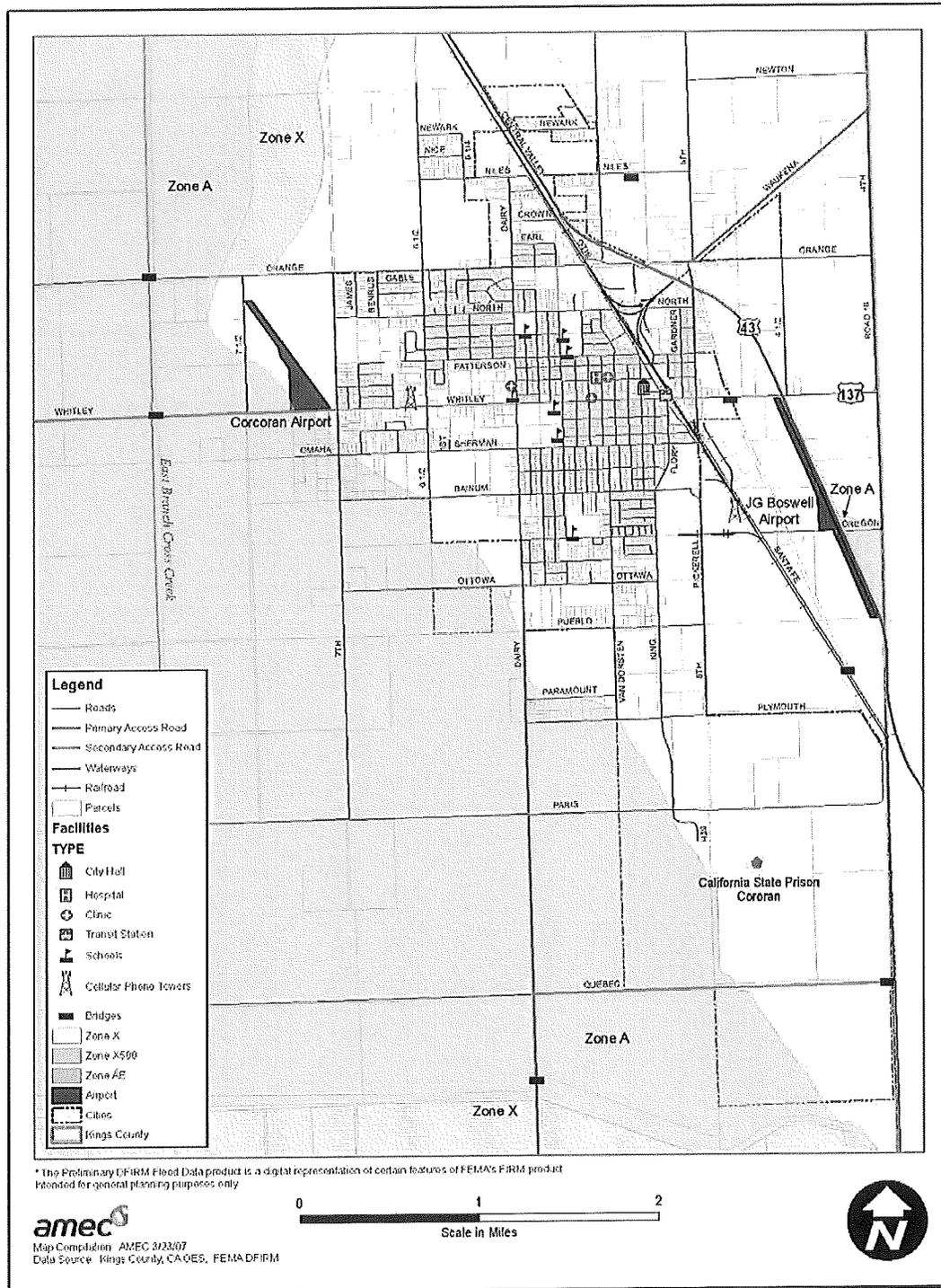
Facility	Replacement Value	Occupancy/Capacity
City Hall/Police Department		
Kings County Fire Station		
Corcoran District Hospital		
Water treatment stations (3)		
Water wells, booster pumps (7), and storage tanks		
Wastewater treatment plant		2.0 MGD
Wastewater distribution system (16 sewer lift stations and 18 miles of transmission lines)		
Water storage tanks		
Veterans' Hall		
<u>Schools</u>		
Bret Harte Elementary		
John C. Fremont School		
John Muir Middle School		
Mark Twain School		
Corcoran High School		
Kings Lake Education Center		

The city provides water, sewer, and storm drainage services. Water is tapped through wells controlled by the Public Works Department. Facilities include three water treatment stations, seven booster pumps, and water storage tanks. The city has purchased 146 acres north of the existing city limit with the intention of drilling four water wells. In a recent event (2006), the State closed water well because of apparent collapse, which instead turned out to be dirt in the well. The city brought in and distributed bottled water and was reimbursed by California Office of Emergency Services for \$400,000.

The wastewater treatment plant is located at the corner of Pueblo and Kings Avenues. Effluent is disposed on 338 acres located south of this location. The wastewater distribution system includes 16 sewer lift stations and approximately 18 miles of transmission lines. The storm water system includes seven lift stations and underground transmission lines for stormwater flows. It also uses the Corcoran Irrigation District transmission line/canal located along Dairy Avenue and along Sherman Street to carry storm water flows to the storm water retention pond located on Oregon Avenue. There are plans to construct a third retention pond on the northwest side of the city.

The state prisons in Corcoran cover over 942 acres. Corcoran's planning team discussed the need to evaluate the unique emergency considerations the prison may pose for the city and to coordinate with the prison on their emergency response plans.

Figure C.1: Corcoran Flood Hazards



Estimating Potential Losses

Table C.3 shows Corcoran’s total exposure to hazards in terms of population and the number and values of structures. Kings County Assessor’s data was used to calculate the improved value of parcels. GIS was used to quantify the number and value of structures in the 100-year (Zone A) and 500-year (X-500) flood hazard areas. More information on how these estimates were calculated can be found in the Vulnerability Assessment section in Chapter 3.

Table C.3: City of Corcoran—Exposure to Hazards

Corcoran	Population	Structures	Value
Total Exposure (Earthquake)	23,448	2,966	\$257,957,828
Flood: Zone A		12	\$721,413
Flood X-500		12	\$721,413
Wildfire: Very High Threat		0	0

Source: Kings County Assessor’s data, FEMA Q3, and AMEC

The local economy in Kings County and particularly in Corcoran, depends on the agricultural industry. Natural hazard events that may not significantly threaten life or structural property but that result in agricultural losses, such as drought, flooding, and freezing temperatures, can have rippling impacts on Corcoran’s economy. Agricultural losses result in lost jobs in the field and local processing plants, which eventually leads to declining sales tax revenue for the local government.

Impacts of past events and vulnerability to specific hazards are summarized below.

Drought

Corcoran obtains its drinking water from groundwater sources. Drought events deplete the aquifer, which affects water quality and increases water treatment costs. Surface water is used for irrigation purposes. The Cross Creek Flood Control District controls and distributes these water rights. When there is a shortage of surface water, agriculture acreage may be left fallow, negatively affecting the local economy. The 1987-1992 drought resulted in the city adopting the Water Use and Service ordinance in 1991 to prohibit certain wasteful water uses. The ordinance is described further in the Capability Assessment section below.

Earthquake

Corcoran is in Seismic Zone 3, where California does have certain requirements for the seismic building safety of police and fire facilities and hospitals. Although the mapped seismic hazard is not as great as in other parts of the county, Corcoran is located in areas where the soils are mapped as having liquefaction potential. In addition, there are several unreinforced masonry buildings in downtown. Corcoran’s planning team identified the hospital, which was built before 1973, as a vulnerable structure to an earthquake event.

Extreme Heat

During the extreme heat event in summer 2006, human safety, agricultural crops, and livestock were impacted in Corcoran. There were four fatalities, of which most were elderly citizens. The cotton yield was smaller than normal, and 20 percent of the tomato crop was lost. The extreme

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heat also caused death in livestock and created a problem in carcass disposal. Power outage was also a problem. The city opened cooling centers during this event.

Flood

Corcoran is located on the eastern edge of the Tulare Lakebed, which is mapped in the 100-year flood hazard area. Flood vulnerability has been lessened by structural measures such as levees. In 1983, emergency flood protection levees were constructed along Cross Creek and the Tule River to protect Corcoran from Tulare Lake flooding. In the emergency situation, the levees were not built to certification criteria. Corcoran is not located in the mapped inundation area for dam failures. However, if there was an upstream dam failure that occurred at a time when there was already flooding in the lake basin, then the city would be at risk. No critical facilities are located in the mapped flood hazard areas except a corner of the Corcoran airport and the east side of Highway 43 near the JG Boswell airport.

Fog

Fog is primarily a life-safety concern in Corcoran that is related to traffic accidents. Fog advisories are used to delay school and bus schedules. Potential mitigation of fog hazards involves better street lights, traffic lights, and controlled intersections. State Highway 43 is one problem area, and solutions will require working with the California Department of Transportation. The city recently annexed areas on the east side of Highway 43. Development here is likely make the fog-related traffic problem worse.

Other Hazards

Past freezing events have caused city-owned water pipes and valves to break. The recent January 2007 freeze hit local pistachio farmers the hardest. Expansive soils do exist in the county and there are construction requirements addressed in building permits. There are also issues with land subsidence, which primarily impact water wells causing them to buckle. Subsidence also may affect levees and canals.

Future Development Trends

Growth is occurring in the northwest, southeast, and northeast parts of Corcoran, and the city has recently annexed additional parcels in these areas. Population has grown rapidly in Corcoran over the past several years. This is partly due to the state prison inmates and staff and also due to recent annexations. Much of the area to the west side of the city is part of the old Tulare Lakebed and is in the 100-year flood hazard area. The planning team believed there are some issues with the levees in this area.

Table C.4 City of Corcoran—Change in Population and Housing Units, 2000-2006

2000 Population	2006 Population	Percent Change	2000 Housing Units	2006 Housing Units	Percent Change
20,835	23,448	12.5%	3,016	3,367	11.6%

Source: U.S. Census Bureau, 2007.

CAPABILITY ASSESSMENT

Capabilities are the programs and polices currently in use to reduce hazard impacts or that could be used to implement hazard mitigation activities. The assessment is divided into five sections: regulatory, administrative and technical, fiscal, outreach and partnerships, and other mitigation efforts.

Regulatory Capability

The table that follows indicates which planning and land management tools typically used by local and tribal jurisdictions to implement hazard mitigation activities are in place in Corcoran.

Table C.5: City of Corcoran—Regulatory and Planning Capabilities

Regulatory Tool	Yes/No	Comments
General plan	Yes	Updated March 2007
Zoning ordinance	Yes	
Subdivision ordinance	Yes	Includes development fees
Site plan review requirements		
Growth management ordinance	No	City does restrict densities in certain areas
Floodplain ordinance	Yes	Floodplain Management Regulations, 1997
Other special purpose ordinance (stormwater, steep slope, wildfire)	Yes	Water Use and Service, 1991 Resource Conservation and Open Space District
Building code	Yes	Version: 2001 Uniform Building Code California
Fire department ISO rating		Rating:4 Kings County Fire Department
Erosion or sediment control program		
Stormwater management program	Yes	2006 Revised Master Plan. Stormwater drainage charges for new development
Capital improvements plan	Yes	Five-year capital improvements plan
Economic development plan	Yes	
Local emergency operations plan	Yes	

Corcoran General Plan, 2007 – The updated general plan was not yet available for this planning process. It will be incorporated in the hazard mitigation plan in the future, and the city will update the safety element of the general plan with information from this plan.

Floodplain Management Regulations, 1997 – This ordinance designates requirements for proposed building in flood-prone areas within the city. Designated flood-prone areas are based upon the Flood Insurance Rate Map (FIRM) developed for Kings County in 1987 until maps are produced for the city. FEMA has developed new preliminary digital FIRMs (DFIRMs) for all of Kings County, which should be available in 2008.

Water Use and Service Ordinance, 1991 – This ordinance prohibits certain wasteful water uses and designates three water conservation stages, which are implemented by the city manager based upon the recommendations of the public works department.

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Corcoran Planning Commission – The commission is comprised of seven citizen members appointed by City Council. The commission reviews and approves proposals or makes recommendations to the City Council.

Corcoran is currently developing an emergency operations plan in coordination with Kings County, which is expected to be completed in 2008. Other city plans include a capital improvements plan, sewer master plan, water treatment master plan, parks plan, downtown plan, and façade program.

Administrative and Technical Capability

The table below identifies the city personnel responsible for activities related to mitigation and loss prevention in Corcoran. A summary of technical resources follows.

Table C.6: City of Corcoran—Administrative and Technical Capabilities

Personnel Resources	Department/Position
Planner/Engineer with knowledge of land development/land management practices	Community Development Department/Director
Engineer/Professional trained in construction practices related to buildings and/or infrastructure	Public Works Department/Director
Full time building official	Community Development Department. One building official and two code enforcement officers.
Floodplain administrator	The City Manager is appointed the floodplain administrator by ordinance
Emergency manager	The Police Chief is appointed the emergency manager by ordinance
Grant writer	Community Development Department or contractor
GIS technician	Community Development Department/part-time position

Corcoran contracts with the Kings County Planning Agency for GIS data and technical assistance. The city is currently putting into place the Connect CTY system. This service is a fully managed application service provider that allows municipalities to deploy a time-based emergency notification system to citizens.

Fiscal Capability

The following table identifies financial tools or resources that the city could potentially use to help fund mitigation activities. There are currently no specific funding sources for hazard mitigation.

Table C.7: City of Corcoran —Available Financial Resources

Financial Resources	Accessible/Eligible to Use	Comments
Community Development Block Grants	Yes	
Capital improvements project funding	Yes	Impact fees

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Financial Resources	Accessible/ Eligible to Use	Comments
Authority to levy taxes for specific purposes	Yes	
Fees for water, sewer, gas, or electric services	Yes	Water, sewer, storm drainage
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	

The city collects water, sewer, and storm drainage fees, and a contractor collects refuse fees. The city also collects impact fees for new development. In the past, Corcoran has incurred debt through special tax bonds for \$18 million through the redevelopment agency to address arsenic in water by paying for a ponding basin.

Outreach and Partnerships

Corcoran participates in the “Are You Okay?” program administered by the Kings County Sheriff’s Office. The program is a free computerized telephone system used to check on senior citizens or disabled/homebound individuals. The Amigos de la Comunidad was a successful outreach program of the Corcoran Police Department intended to form a partnership with the Spanish speaking community. The program is still in existence but not very active; it could potentially be used to communicate to the Latino community about hazards and emergencies.

SUMMARY OF KEY ISSUES AND RISK

Corcoran’s risk assessment revealed problem areas to be addressed in the mitigation strategy. These include the following:

- Drought events deplete the aquifer from which Corcoran obtains its groundwater, which affects water quality and increases water treatment costs. Drought also impacts the local agricultural economy.
- Earthquake hazard risk in Corcoran is moderate but soils have liquefaction potential, which may amplify the effects of ground shaking.
- The hospital and fire department, as well as several unreinforced masonry buildings located in downtown, have been identified as vulnerable in an earthquake event.
- Tule fogs during the winter season create dangerous conditions at traffic intersections and along State Highway 43.
- Extreme heat events are highly likely to continue in the future and are dangerous to humans, particularly the elderly, and to livestock.
- Corcoran is located on the eastern edge of the Tulare Lake basin and is protected by levees from periodic flooding.

Annex C: City of Corcoran

- Corcoran continues to experience steady growth, which increases its vulnerability to hazards, including earthquakes, flooding, and drought.

GOALS AND OBJECTIVES

The city of Corcoran adopts the hazard mitigation goals and objectives developed by the Hazard Mitigation Planning Committee and described in Chapter 4.

MITIGATION ACTIONS

The planning team for the city of Corcoran identified and prioritized the following mitigation actions based on the risk assessment. Background information as well as information on how the action will be implemented and administered, such as ideas for implementation, responsible office, partners, potential funding, estimated cost, and timeline also are described.

Mitigation Action: Corcoran #1—Veterans' Memorial Building

Action:	Expand the Veterans' Memorial Building and designate it as an emergency shelter.
Jurisdiction:	City of Corcoran
Priority:	High
Issue/Background:	Currently, the Veterans' Memorial Building has a capacity of 200 people. This is the only public hall located in Corcoran outside of the YMCA and the seniors' centers. This is an ideal site to operate a facility for people to come to cool off during extreme heat events and for other disaster-related needs due to its location adjacent to the Corcoran Hospital. We feel we would need to have the capacity to handle at least 400 people and more, if possible.
Ideas for Implementation:	Our proposal is to expand the hall north toward Hannah and the Corcoran District Hospital adding additional room for any and all public functions and needs.
Responsible Office:	Corcoran Public Works Department
Partners:	State of California, various veterans' groups
Potential Funding:	HMPG, PDM, other grant sources from state or veterans' groups
Cost Estimate:	\$1,000,000
Benefits: (Losses Avoided)	Reduce health impacts during extreme heat events by providing a cooling station adjacent to the hospital. Improve response and preparedness for emergency events by developing an emergency shelter in the center of town. This is a multiobjective project that will provide a public building to serve other community needs as well.
Timeline:	End of 2008
Completed by:	Steve Kroeker, Public Works Department, Director

Mitigation Action: Corcoran #2—Assessment of Critical Facilities

Action:	Assess vulnerability of critical facilities, including police/fire stations, hospitals, schools, and others, to identify and prioritize projects for multi-hazard risk reduction.
Jurisdiction:	City of Corcoran
Priority:	High
Issue/Background:	In the case of a natural or manmade disaster, we need to ensure that our critical facilities will remain operational or quickly recover from the event and comply with all state and federal regulations.
Ideas for Implementation:	Obtain funds for structural engineering inspections of critical structures within the city. Public schools and hospitals must comply with all federal and state regulations regarding design loads and seismic load designs. Once inspections are completed, needed projects can be identified and prioritized for funding and implementation.
Responsible Office:	Corcoran Building Department
Partners:	Public schools, hospitals, private engineering companies
Potential Funding:	Hazard Mitigation Grant Program, Pre-Disaster Mitigation Program, other U.S. Department of Homeland Security grants
Cost Estimate:	Unknown
Benefits: (Losses Avoided)	Improved structural stability of our critical care facilities, fire/police facilities, and schools, which are critical to our ability to provide emergency medical and other services to the citizens of our community and to protect our children.
Timeline:	Three to five years
Completed by:	Kevin Tromborg, Building Department, Building Official

Mitigation Action: Corcoran #3—Assessment of Lifeline Utilities

Action:	Assess vulnerability of lifeline utilities, including water distribution systems, to identify and prioritize projects for multi-hazard risk reduction.
Jurisdiction:	City of Corcoran
Priority:	High
Issue/Background:	All of these systems are set up and evaluated for safe delivery of water and removal of wastewater with the quality of the water and integrity of the wastewater stream being paramount. An assessment of the risks due to hazard events has not been done and would be beneficial and an asset to the City of Corcoran.
Ideas for Implementation:	The water treatment, distribution, wastewater treatment and collection system should be evaluated and reviewed by professionals who are familiar with the impacts of hazard events and who can make recommendations as to how to mitigate these risks. Once the evaluation is completed, the city can identify and prioritize mitigation projects needed in the future.
Responsible Office:	Corcoran Public Works Department
Partners:	
Potential Funding:	California Department of Health Services, Regional Water Quality Control Board
Cost Estimate:	\$100,000
Benefits: (Losses Avoided)	Reduced vulnerability of water and wastewater systems to hazard events, which will help protect life and property.
Timeline:	Three to five years
Completed by:	Steve Kroeker, Public Works Department, Director

Mitigation Action: Corcoran #4—Vulnerable Populations

Action:	Develop a program or system for supporting vulnerable populations during emergency events.
Jurisdiction:	City of Corcoran
Priority:	Medium
Issue/Background:	During emergency events, such as extreme heat, power outages etc., there are certain populations at greater risk of suffering medical complications or death. Individuals who rely on electronic medical equipment may not have the capability of using their medical equipment during a power outage. Elderly and ill people are more susceptible to heat-related illness and death during extreme heat events and need to have access to cooling centers. People who live in houses that do not have air-conditions systems need access to cooling centers during extreme heat events.
Ideas for Implementation:	Establish a committee consisting of Public Works, Fire Department, Police Department, local school officials, local medical professionals, and senior citizens groups to identify vulnerable populations and what needs they would have during different emergency events. Identify at least two locations within the city that could be used during emergency events and ensure they are capable of operating on generator power. Utilize the city's Connect CTY telephone system to inform vulnerable populations of the availability of these centers prior to and during emergency event. Have a plan in place for public works to supply transportation to the facility for those who can not get there on their own. Coordinate with medical professionals to determine how best to get the individuals medical equipment to the facility. Ensure there is a supply of water, blankets and other necessities available.
Responsible Office:	Corcoran Police Department
Partners:	Corcoran Fire Department, Corcoran Public Works Department, school officials, medical officials, senior citizen groups
Potential Funding:	Hazard Mitigation Grant Program, Pre-Disaster Mitigation Program, Corcoran General Fund
Cost Estimate:	\$20,000-\$50,000
Benefits: (Losses Avoided)	Avoids medical emergencies of individuals dependent on medical resources from an already limited pool of emergency resources. Reduces risk to human health and safety during emergency events among the most vulnerable populations.
Timeline:	One year
Completed by:	Gary Cramer, Police Department, Commander

Mitigation Action: Corcoran #5—Safety Element of the General Plan

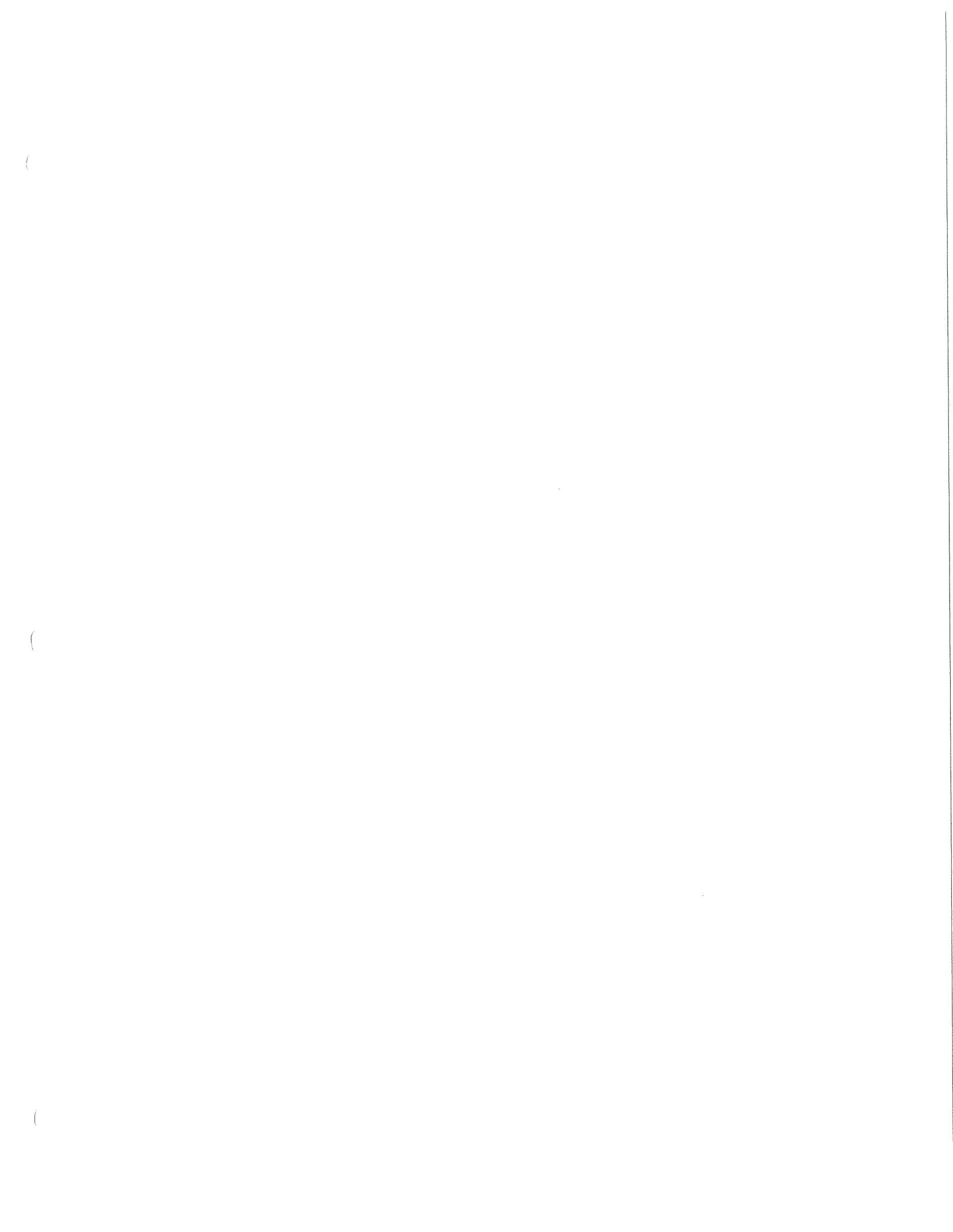
Action:	Update Safety Element of the General Plan
Jurisdiction:	City of Corcoran
Priority:	Medium
Issue/Background:	The multi-hazard mitigation plan includes a complete hazard risk assessment for the city of Corcoran, similar to information required in the Safety Element of the General Plan. Updating the Safety Element to incorporate this information avoids duplication of effort, improves consistency between city plans, and helps to implement the findings of the mitigation plan.
Ideas for Implementation:	After the multi-hazard mitigation plan is finalized the Safety Element will be reviewed and revised as necessary.
Responsible Office:	Corcoran Community Development Department
Partners:	
Potential Funding:	In-Kind, Corcoran General Fund
Cost Estimate:	\$1,200 for public hearing notices and staff time to amend the General Plan.
Benefits: (Losses Avoided)	Ensure the Hazard Mitigation Plan is incorporated into the City's General Plan Policy.
Timeline:	The Safety Element will be updated within six months of the completion of the hazard mitigation plan
Completed by:	Jeri Grant, Community Development Department, Director

Mitigation Action: Corcoran #6—Natural Hazards Review Criteria

Action Title:	Implement natural hazard review criteria for new development to improve long term loss prevention.
Jurisdiction:	City of Corcoran
Priority:	Medium
Issue/Background:	Improving and enforcing all building and planning requirements leads to stronger, safer land development.
Ideas for Implementation:	This action will be implemented primarily through the adoption of the 2006 International Building Code and the 2007 City General Plan, relating to land use and planning. The Building and Planning Departments will work more closely together to prevent or oversee excessive population densities and overcrowding of land with structures. The use of natural and manmade wind barriers and strict enforcement of all seismic D1 design category requirements will be implemented.
Responsible Office:	Corcoran Building Department and Corcoran Planning Department
Partners:	
Potential Funding:	In-Kind, Corcoran General Fund
Cost Estimate:	
Benefits: (Losses Avoided)	Well-placed developments with modern building requirements and strict enforcement of both will result in safe and stronger earthquake and wind resistant structures and developments.
Timeline:	2007 General Plan adopted in May 2007; Updated building code adoption in January 2008
Completed by:	Kevin Tromborg, Building Department, Building Official

Mitigation Action: Corcoran #7—Updated Building Codes

Action:	Adopt the 2006 International Building Code (IBC) to improve disaster resistance of future buildings.
Jurisdiction:	City of Corcoran
Priority:	Medium
Issue/Background:	The city currently uses the 2001 California Building Code based on the 1997 Uniform Building Code.
Ideas for Implementation:	In July 2007, submit to the Corcoran City Council an update to Title 9 of the Corcoran City Code adopting the 2006 California Building Code based on the 2006 IBC; the 2004 California Electric Code based on the 2002 National Electric Code; and the 2006 California Plumbing and Mechanical Code based on the 2006 Uniform Plumbing and Mechanical Codes/Title 24 2005 Energy Code. All will be effective by January 1, 2008.
Responsible Office:	Corcoran Building Department
Partners:	
Potential Funding:	In-Kind, City budget for 2007/2008
Cost Estimate:	\$3,500
Benefits: (Losses Avoided)	The IBC has standardized the building industry with modern up-to-date building codes addressing the design and installation of building systems through requirements emphasizing performance. Adoption of these standards will improve the safety of future building in Corcoran.
Timeline:	Adoption of codes in January 2008.
Completed by:	Kevin Tromborg, Building Department, Building Official





ANNEX D: CITY OF HANFORD

COMMUNITY PROFILE

The city of Hanford is governed by a five-member City Council. Members of the council are elected by district and serve four-year staggered terms. Each year the members select a mayor and vice-mayor from amongst themselves.

Geography and Climate

Hanford is located in the northeastern part of Kings County, approximately 30 miles southwest of the city of Fresno. It is about equidistant from the Sierra Nevada and the Coast Ranges. State Highway 198 runs east and west through Hanford and State Highway 43 runs north and south along the easterly boundary of the city. The ultimate growth boundary of Hanford, which is based on the city's current general plan, includes the incorporated city and its sphere-of-influence and encompasses approximately 30 square miles.

The terrain in Hanford is generally flat and made up of sandy, loam soils. It slopes from northeast to the southwest. Elevations range from 255-240 feet above mean sea level. Like the rest of Kings County, Hanford is in a semiarid climate. It receives average annual precipitation of 8.6 inches. The average high temperature in summer is 96°F and in winter is 49°F. The People's Ditch in the northeastern section of the city is a manmade facility designed as part of a water delivery system that diverts water from the Kings River and distributes it to agricultural areas to the south.

History

Hanford was named after James Madison Hanford, a paymaster for the Central and Southern Pacific Railroad, in 1877. It was incorporated in 1891, after 14 years of destructive fires in the downtown area, to improve firefighting services and provide utilities and paved streets. The settlement quickly grew into a bustling pioneer town with shops, schools, hotels, saloons, and churches. As the county seat, Hanford has developed into the residential, commercial, and industrial center of Kings County.

Economy

Hanford is home to the county's largest employers, including the Kings County Government Center (1,203 jobs), Del Monte (435 full-time jobs/1,500 seasonal jobs), Hanford Elementary (520 jobs), Wal-Mart (300 jobs), Hanford Community Medical (700 jobs), Central Valley Hospital (357 jobs), and Marquez Brothers (306 jobs). The city's enterprise zone, foreign trade zone, and industrial park offer incentives for new businesses (Kings County 2004).

Population

Hanford's estimated 2006 population is 49,048. This represents an 18 percent increase over the population at the time of the 2000 U.S. Census (California Department of Finance 2007). Hanford's population is 64 percent white, 5 percent black or African American, and 21 percent

Annex D: City of Hanford

“some other race.” Census data indicates that 39 percent of Hanford’s population is of Hispanic origin (U.S. Census Bureau 2000). Growth in Hanford is projected to remain strong with a projected population of 70,177 in 2020 (City of Hanford 2006).

HAZARD IDENTIFICATION AND PROFILES

Representatives from the city of Hanford identified hazards that affect the city and developed hazard profiles based upon the countywide risk assessment and past events and their impacts. Definitions for the rankings used can be found in Chapter 3: Risk Assessment.

Table D.1: City of Hanford—Hazard Profiles

Hazard	Probability of Occurrence	Spatial Extent	Potential Magnitude	Significance
Dam Failure	Unlikely	Extensive	Critical	Low
Drought	Occasional	Extensive	Critical	High
Earthquake	Occasional	Extensive	Critical	High
Extreme Heat	Highly Likely	Extensive	Limited	Medium
Flood	Occasional	Significant	Limited	Low
Fog	Highly Likely	Extensive	Limited	Medium
Freeze	Likely	Extensive	Limited	Medium
Landslide	Unlikely	Limited	Negligible	Low
Soil Hazards: Expansive, Liquefaction, Erosion	Occasional	Extensive	Limited	Low
Tornado	Occasional	Limited	Limited	Low
Wildfire	Unlikely	Limited	Negligible	Low

VULNERABILITY ASSESSMENT

The vulnerability assessment analyzes the population, property, and other assets at risk to natural hazards. This section lists Hanford’s assets at risk to natural hazards, including critical facilities and infrastructure; historic, cultural, and natural resources; and economic assets. It discusses the impacts that occurred in past events and vulnerability to specific hazards ranked of medium to high significance.

Annex D: City of Hanford

Asset Inventory

The table that follows lists the critical facilities and other community assets identified by representatives from Hanford as important to protect in the event of a disaster.

Table D.2: City of Hanford—Critical Facilities and other Community Assets

Facility	Replacement Value	Occupancy/Capacity
Hanford Police Department	\$34,000,000	
Hanford Fire Station No. 1	\$3,800,000	
Hanford Fire State No. 2	\$1,900,000	
Hanford City Airport	\$15,000,000	
Hanford Community Medical Center		
Central Valley General Hospital		
Kerr Center Outpatient Center		
Del Monte Foods		
Adventist Health		
Marquez Brothers		
Senior Center Vets Building	\$3,800,000	
Historic Courthouse Square	\$11,500,000	
Above-Ground Water Tanks	\$8,800,000	
Wastewater Treatment Plant	\$60,000,000	
Kings Fairgrounds		
City Hall	\$4,500,000	
Civic Auditorium	\$4,500,000	
City Pool	\$3,500,000	
Longfield Center	\$4,500,000	
Kings County Government Center		
Kings County Library		
AMTRAK Station		
Carnegie Museum		
China Alley		
Hanford Fox Theater		
Hanford Fraternal Hall		
Downtown Old Sears Building		
Douty Street Phone Building Switching/Control		
Schools		
Hanford Elementary School District: 11 schools		
Hanford High School		
Hanford West High School		
E.F. Johnson High School		
Pioneer Middle School		
St Rose McCarthy Catholic School		

Annex D: City of Hanford

Facility	Replacement Value	Occupancy/Capacity
Western Christian School		
College of Sequoias Campus/Learning Center	35,000,000	
GWF Power System (Generation) Plant		
Hanford Industrial Park		

The Hazards Management Element of the Hanford General Plan (2002) indicates that two additional fire stations are needed to maintain acceptable standards based on population and area of growth considered by the Land Use Map. The desired locations are near 12th Avenue south of Highway 198 and near East Lacey Boulevard north of Highway 198.

Estimating Potential Losses

Table D.3 shows Hanford’s total exposure to hazards in terms of population and the number and values of structures. Kings County Assessor’s data was used to calculate the improved value of parcels. GIS was used to quantify the number and value of structures in the 100-year (Zone A) and 500-year (X-500) floodplains. More information on how these estimates were calculated can be found in the Vulnerability Assessment section in Chapter 3.

Table D.3: City of Hanford—Exposure to Hazards

Hanford	Population	Structures	Value
Total Exposure (Earthquake)	49,048	14,080	\$1,991,860,304
Flood: Zone A		6	\$2,549,083
Flood X-500		6	\$2,549,083
Wildfire: Very High Threat		0	0

Source: Kings County Assessor’s data, FEMA Q3, and AMEC

Although the potential magnitude of hazards in Hanford’s planning area are less than in other parts of the county, the highest concentration of population and structures can be found here. This includes many structures of historical significance, as well as cultural significance, such as the Fort Roosevelt Natural Science and History Museum and the Ruth and Sherman Lee Institute for Japanese Art.

Hanford is less socially vulnerable than other parts of Kings County based on demographic factors, including a more affluent population. However, there is a higher proportion of population over 65 (10 percent), which the city should plan for in its outreach and response efforts, as well as for other special needs populations.

The impacts of past events and vulnerability to specific hazards are summarized below.

Drought

The city of Hanford relies on a groundwater system for municipal water. The city works with the Kings County Water District to deliver excess flows from the Kings River and stormwater runoff into drainage basins to replenish groundwater. When drought events deplete the aquifer, water quality decreases and water treatment costs increase. The Urban Water Management Plan

Annex D: City of Hanford

(2005) assesses the city's vulnerability to different drought scenarios and plans for the actions to be taken during water shortages. For more information on the plan, see the Capability Assessment below.

Earthquake

Hanford has experienced several ground shaking events from earthquakes over the past few years, both from the San Andreas fault and from the Mammoth area, more than 100 miles to the north. The potential for ground shaking is mapped at 20-30% g, the percent probability of exceeding peak ground acceleration in the next 50 years. Soils in Hanford are not mapped as having significant liquefaction potential and the Hazards Management Element of the General Plan finds that Hanford is located in a stable geologic formation so that the effects of ground shaking should be minimal. The community's vulnerability increased due to its large number of unreinforced masonry buildings, many of them historic properties. The city has created a database of the locations of these buildings, which includes many of significance to the community, such as the Kings County Courthouse, Masonic Temple, Episcopal Church, and the Hanford Elementary District Offices.

Extreme Heat

During the extreme heat event in summer 2006, human safety was affected in Hanford. Extreme heat is highly likely to occur on an annual basis in Hanford, which causes an increase in energy cost and a danger to the elderly and outside workers. The city did not open cooling centers during the 2006 extreme heat event. The Hanford Mall offered to provide the mall as a location for cooling.

Flood

Most of the terrain in Hanford is relatively flat with good drainage due to the sandy loam subsoil. Street flooding is the principal flood problem. There are no proposed or completed flood protection measures in the city. The east branch of Peoples Ditch is a manmade facility, which is part of the water delivery system that diverts water from the Kings River and distributes it to agricultural areas south of the Kings River. The Flood Insurance Study for Hanford (1987) concluded that the Peoples Ditch is not a flood hazard. The city's Flood Damage Prevention Ordinance is based on this study and the 1987 Flood Insurance Rate Map (FIRM). More information on this ordinance is provided in the Capability Assessment below.

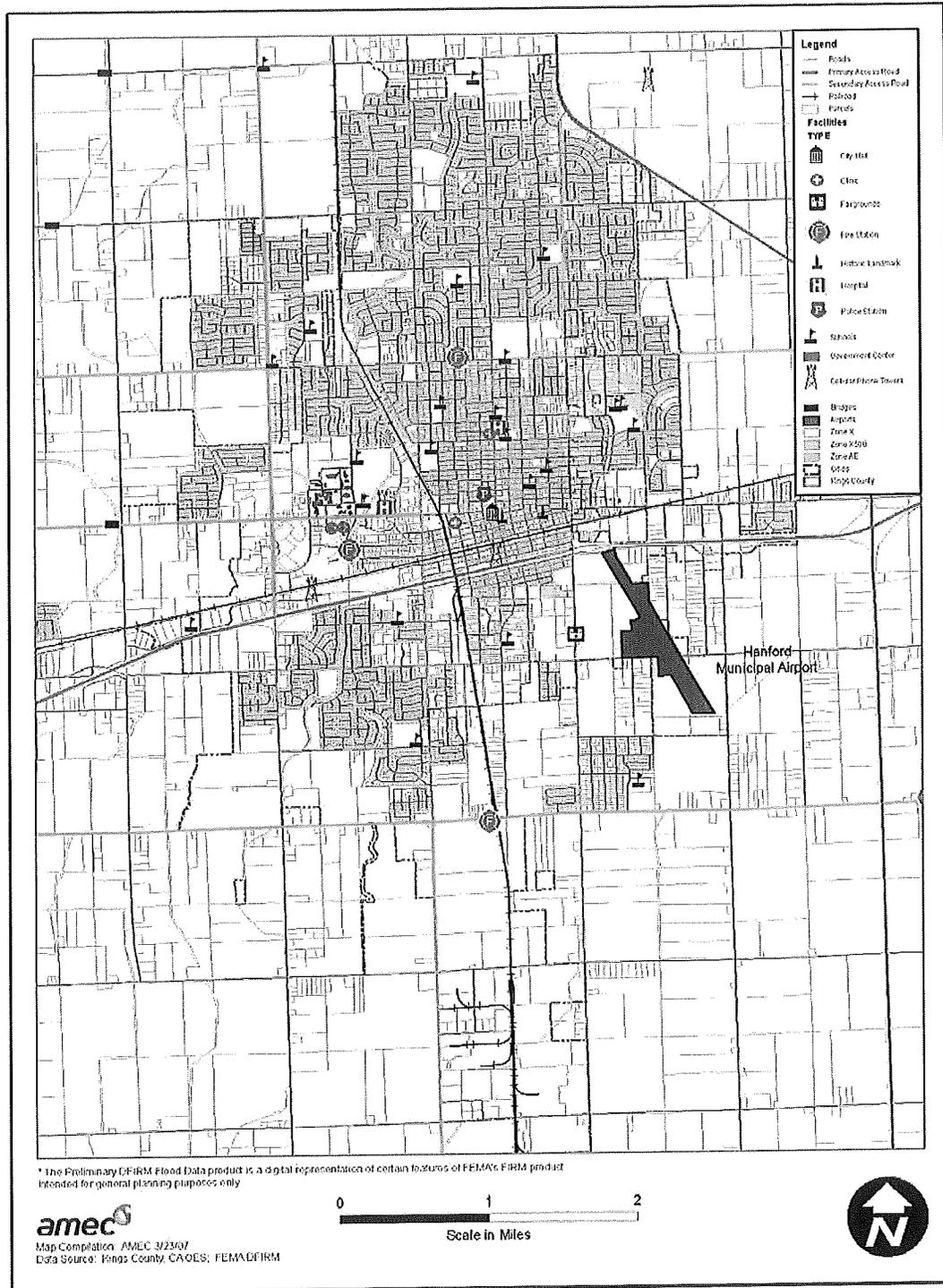
Fog

Fog is primarily a life-safety concern in Hanford that is related to traffic accidents. Fog advisories are used to delay school and bus schedules. The city of Hanford requires the installation of street lights at all intersections as well as along the roadway. Traffic lights are also installed when required by the traffic volume.

Freeze

Past freeze events have caused private and city-owned water pipes and valves to break. Freeze protection requirements for fire protection equipment (fire sprinkler system) have been enforced to protect fire protection system installed using the current fire codes.

Figure D.1: Hanford Flood Hazards



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Other Hazards

Expansive soils do exist in the county and there are construction and inspection requirements that address this soil issue.

Tornados are very rare in the city of Hanford. In the event of a tornado or extreme weather, the Hanford Fire and Police department will increase staffing base on information provided by the National Weather Service. The National Weather Service has an office in Hanford. City departments have an excellent working relationship with the Hanford office staff.

Future Development Trends

The Hanford General Plan plans for growth from the standpoints of infrastructure, farmland, circulation, and impacts from and to adjacent communities. Sewer services are most likely to limit growth to the west, east, and north over time. The plan focuses growth in downtown, as the cultural and business center of the community, and in redevelopment of areas within the city. Growth to the south is expected to occur similar to that which has occurred over the past several years. Open space corridors are encouraged along railroads and other noise generating uses and along highways and entry ways into the city to help portray the agricultural heritage of Hanford.

Table D.4 City of Hanford—Change in Population and Housing Units, 2000-2006

2000 Population	2006 Population	Percent Change	2000 Housing Units	2006 Housing Units	Percent Change
41,686	49,048	17.7%	14,721	16,867	14.6%

Source: U.S. Census Bureau, 2007.

CAPABILITY ASSESSMENT

Capabilities are the programs and polices currently in use to reduce hazard impacts or that could be used to implement hazard mitigation activities. The assessment is divided into five sections: regulatory, administrative and technical, fiscal, outreach and partnerships, and other mitigation efforts.

Regulatory Capability

Table D.5 lists planning and land management tools typically used by local jurisdictions to implement hazard mitigation activities and indicates those that are in place in Hanford.

Table D.5: City of Hanford—Regulatory and Planning Capabilities

Regulatory Tool	Yes/No	Comments
General plan	Yes	Adopted June 2002
Zoning ordinance	Yes	
Subdivision ordinance	Yes	
Site plan review requirements	Yes	
Growth management ordinance	No	

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Regulatory Tool	Yes/No	Comments
Floodplain ordinance		Flood Damage Prevention Regulations 1998
Other special purpose ordinance (stormwater, steep slope, wildfire)	Yes	Stormwater
Building/fire code	Yes	Version: California Building Standards Code 2005
Fire department ISO rating		Rating: 4 Hanford Fire Department
Erosion or sediment control program	No	
Stormwater management program	Yes	
Capital improvements plan	Yes	
Economic development plan	Yes	City of Hanford 2010 Plan
Local emergency operations plan	Yes	Updated annually

The city collects development impact fees for park facilities, fire protection, police protection wastewater system, transportation, water system, stormwater system, and refuse and recycling. The planning department refers appropriate project applications to the fire department and/or police department for review and comment.

Hanford General Plan, 2002 – The General Plan was updated in 2002 and is intended to guide the development of Hanford over the next 20-25 years. The plan sets goals, objectives, policies, and programs for six elements: land use; circulation; hazards management; open space, conservation, and recreation; housing; and public facilities and services. The hazards management element addresses seismic safety, safety, noise, and air quality. Objectives, policies, and programs related to this hazard mitigation plan include the following:

Objective HZ 1 Protect Hanford from hazards associated with the natural environment.

Policy HZ 1.1 Minimize risks of personal injury and property damage associated with natural hazards.

- Program HZ 1.1-A Participate in state and county programs to educate the residents on procedures regarding preparedness and response to natural disasters, providing information describing procedures and evacuation routes to be followed in the event of a disaster.
- Program HZ 1.1-B Design consideration shall be given for future evacuation routes as a component of the street construction and improvement programs of the city. The city shall coordinate its planning and design efforts with other agencies including Kings County and California Department of Transportation.

Policy HZ 1.2 Mitigate potential adverse impacts of geologic and seismic hazards.

- Program HZ 1.2-A Where questionable conditions exist, require geologic and soils studies to identify potential hazards as part of the approval process for all new development prior to grading activities.

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- Program HZ 1.2-B Require that underground utilities be designed to withstand seismic forces.
- Program HZ 1.2-C Continue to incorporate appropriate earthquake prevention standards into the city uniform building codes and require that all new structures be engineered to meet seismic safety code standards.

Objective HZ 3 Provide high quality emergency services to protect life and property in the City of Hanford.

Policy HZ 3.1 Provide for efficient and cost effective fire and emergency medical service to minimize potential injury, loss or destruction to persons or property.

- Program HZ 3.1-A Continue with an intensive weed abatement program to minimize fire hazards near urban uses.
- Program HZ 3.1-D Maintain mutual aid with Kings County, City of Lemoore, and Lemoore Naval Air Station Fire Departments, and the California Division of Forestry.

Policy HZ 3.2 Implement the Emergency Preparedness Plan.

- Program HZ 3.2-A Update the Emergency Preparedness Plan annually to respond to changes in land use, population and incorporated city boundaries, including: evacuation routes; location of critical facilities; peak load water supply requirements; minimum road widths and turning radii; and identification of the population at risk.
- Program HZ 3.2-B Coordinate with Kings County, Federal Emergency Management Agency, office of Emergency Services, in reducing community risk in the event of a disaster through Emergency Preparedness Plan preparation and disaster drills.
- Program HZ 3.2-C Coordinate city evacuation routes with Kings County's emergency evacuation routes.
- Program HZ 3.2-D Ensure that public and private water facilities have adequate capacity to supply emergency needs.

Flood Damage Prevention Regulations, 1998 – The purpose of this ordinance is to minimize public and private losses due to flood conditions by restricting certain uses and requiring certain protections in areas of special flood hazards as identified in FEMA's 1987 FIRM. Preliminary digital FIRMs (DFIRM) for all of Kings County have been created and are expected to be available in 2008.

Urban Water Management Plan, 2005 – This plan describes the vulnerability of the city's water supply to seasonal or climatic shortage. It compares the projected normal, single-dry, and multiple-dry year water supply to the projected water demand for each of these scenarios over the next 25 years, in 5-year increments. The plan designates water shortage stages of action, including up to a 50 percent reduction, and outlines specific water supply conditions at each stage.

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Hanford Emergency Plan, 2006 – The emergency plan defines the responsibilities of the city staff in response to emergency situations and provides for the powers and duties of the Disaster Council. Hanford has adopted Section 6-3 of the Kings County Code of Ordinances providing for disaster council membership. The Disaster Council develops and recommends for adoption by the Kings County Board of Supervisors and city councils of Avenal, Corcoran, Hanford, and Lemoore emergency and mutual aid plans and agreements and necessary ordinances and resolutions.

Water Conservation and Water Meter Program - The city of Hanford has a water conservation program that limits the use of outdoor watering through regulating the timing and types of outdoor water use. Water meters are required on services for all new construction, remodels in excess of \$5,000 or installation of a swimming pool. At the request of a customer to convert from a flat rate service to a metered service, the city will install the meter and bill the customer for costs not to exceed \$500.

Conservation and Open Space Zoning District – This zoning district applies to pathways, storm drainage basins, and water recharge areas throughout the city and is intended to provide for permanent open spaces in areas of the city that exhibit significant vegetation, scenic qualities, wildlife or recreation potential, and that are designated as open space sites by the General Plan.

Other city plans include the Downtown Architectural Design Guidelines Plan, Master Streetscape and Street Tree Plan, Hanford 2010 Plan, and the City of Hanford 2005-2009 Consolidated Plan (2004), which was submitted to the U.S. Department of Housing and Urban Development to document the city's comprehensive strategy to address the needs of low and moderate income residents.

Administrative and Technical Capabilities

The table below identifies the city personnel responsible for activities related to mitigation and loss prevention in Hanford. A summary of technical resources follows.

Table D.6: City of Hanford—Personnel Capabilities

Personnel Resources	Department/Position
Planner/Engineer with knowledge of land development/land management practices	Community Development Department
Engineer/Professional trained in construction practices related to buildings and/or infrastructure	Public Works Department
Full time building official	Community Development Department
Floodplain Administrator	Community Development director is appointed by ordinance
Emergency Manager	Hanford Fire Chief
Grant writer	No
GIS	Fire, Police, and Community Development Departments are learning how to use GIS.

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Hanford receives GIS data and technical assistance from the Kings County Planning Agency. There is no warning/notification system in place in Hanford.

Fiscal Capability

The following table identifies financial tools or resources that the city could potentially use to help fund mitigation activities. There are currently no specific funding sources for hazard mitigation.

Table D.7: City of Hanford—Available Financial Resources

Financial Resources	Accessible/ Eligible to Use	Comments
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	Water, sewer, trash
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	

Outreach and Partnerships

The Hanford Fire Department provides several public education programs, including the topics of water use, earthquake awareness, fire safety, disaster preparedness, and other types of public safety classes.

Other Mitigation Efforts

The city of Hanford has improved the stormwater control system to minimize local street flooding. The city has also improved the ability to move stormwater from one stormwater basin to another also to mitigate local flooding.

SUMMARY OF KEY ISSUES AND RISK

Hanford's risk assessment revealed problem areas to be addressed in the mitigation strategy. These include the following:

- Earthquake hazard risk in Hanford is moderate but the city has a large number of older community buildings of unreinforced masonry construction that are vulnerable to ground shaking.
- Hanford relies on groundwater, which can be depleted during drought events, resulting in poor water quality and increased treatment costs.

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- Extreme heat events are highly likely to continue in the future and are dangerous to human safety, particularly to the elderly.

GOALS AND OBJECTIVES

The city of Hanford has made a few changes to the goals and objectives developed by the Hazard Mitigation Planning Committee to tailor them for the city. The amended goals and objectives are presented below:

Goal 1 Reduce impacts of natural hazards to human life, property, and the environment

- 1.1 Promote education and awareness about natural hazards risk, mitigation, and preparedness to citizens, public agencies, elected officials, nonprofit organizations, and businesses
- 1.2 Ensure protection and enhancement of key emergency access routes
- 1.3 Protect critical facilities and infrastructure to minimize loss of critical services
- 1.4 Minimize growth and development in hazard areas
- 1.5 Improve enforcement of existing standards and regulations

Goal 2 Minimize impacts of natural disasters to the economy of the City of Hanford

- 2.1 Encourage water conservation measures among users
- 2.2 Develop plans for post-disaster recovery
- 2.3 Strengthen disaster resistance and resiliency of major employers

Goal 3 Implement identified mitigation activities

- 3.1 Promote hazard mitigation as integrated policy among the City of Hanford the county and with the region and state
- 3.2 Increase communication among communities in the county
- 3.3 Seek funding sources and partners for future mitigation activities
- 3.4 Improve organizational capabilities to address health and safety issues in mitigation and response (i.e., emergency transportation, vulnerable populations)

MITIGATION ACTIONS

The planning team for the city of Hanford identified and prioritized the following mitigation actions based on the risk assessment. Background information as well as information on how the action will be implemented and administered, such as ideas for implementation, responsible office, partners, potential funding, estimated cost, and timeline also are described.

Mitigation Action: Hanford #1—Retrofits of Water Storage Tanks

Action:	Complete seismic retrofits of two of city's water storage tanks.
Jurisdiction:	City of Hanford
Priority:	High
Issue/Background:	The city of Hanford has two water storage tanks holding a combined capacity of 800,000 gallons that are in need of seismic retrofit. In the event of an earthquake, it is possible that the tanks and pipelines connections to the tanks would sustain catastrophic damage depending on the magnitude of the earthquake. In addition, fire risk is greatly increased after earthquakes due to damaged natural gas lines and electrical lines. Without access to water for firefighting, the community is at great risk to a catastrophic loss due to fire.
Ideas for Implementation:	To mitigate this problem, a retrofit to all of the connections to the water tanks will be completed with flexible earthquake dampening connections at the points where the pipelines connect to the tank. A strategy will be developed for funding these projects through grants and or capital improvement projects.
Responsible Office:	Hanford Department of Public Works
Partners:	Hanford Building Department, Hanford Fire Department, Hanford City Council
Potential Funding:	Hazard Mitigation Grant Program, Pre-Disaster Mitigation Program, other state or federal grants, Hanford General Fund
Cost Estimate:	Undetermined
Benefits: (Losses Avoided)	Avoids future losses by making water tanks more resistant to earthquakes and preserving water supply in case of fire. This will also prevent or minimize a health crisis due to lost of drinking water and sanitary facilities.
Timeline:	Five years
Completed by:	Tim Ieronimo, Hanford Fire Department, Chief

Mitigation Action: Hanford #2—GIS Database of URMs

Action:	Develop GIS database of unreinforced masonry (URM) buildings.
Jurisdiction:	City of Hanford
Priority:	High
Issue/Background:	The city of Hanford has 58 URM buildings in the downtown core of the city. The Hanford Fire Department has developed a list of the URM buildings for use during an emergency. The creation of a GIS database of URM buildings with all of the basic building information attached would greatly enhance the response of emergency management personnel during an event and could be used to develop a program for retrofitting these buildings over time.
Ideas for Implementation:	Currently, the city of Hanford, within its fire, police and public works departments, has GIS capabilities to a limited degree. We have some base maps and limited knowledge and training on the GIS software. On the other hand, the Kings County Planning Agency has much greater knowledge and capabilities and is willing to assist the city. With the assistance of the Kings County Planning Agency and the existing database of URM buildings that the Hanford Fire Department has, this project can be completed within a short period of time. GIS training for the Hanford Fire Department will need to be provided to sustain the GIS database.
Responsible Office:	Hanford Fire Department
Partners:	Kings County Planning Agency
Potential Funding:	Hanford Fire Department
Cost Estimate:	\$2,500
Benefits: (Losses Avoided)	A creation of a GIS database of URM buildings with all of the basic building information attached would greatly enhance the response of emergency management personnel during an event. This will also assist in the development of an earthquake loss reduction program to evaluate vulnerability of URMs and prioritize retrofit projects.
Timeline:	To be completed within three months of adoption of this plan.
Completed by:	Tim Ieronimo, Hanford Fire Department, Chief

Mitigation Action: Hanford #3—Retrofit URM Buildings in Downtown

Action:	Retrofit 58 unreinforced masonry (URMs) buildings in downtown Hanford
Jurisdiction:	City of Hanford
Priority:	High
Issue/Background:	The city of Hanford is approximately 45 miles east of the San Andreas and Coalinga Fault. Hanford is also approximately 100 miles south of the Mammoth area. In 1983 the Coalinga earthquake shook throughout the city of Hanford as did the more recent earthquake that occurred two years ago (2004/2005). The city has 58 URMs identified in the downtown area. Occupancies of these buildings are retail, professional services, businesses, apartments, and historic buildings. The cost to reinforce these buildings may exceed the property value of the buildings. Property and business owners are unable or unwilling to contribute financially toward building reinforcement or replacement due to the lack of funds or failure to see the risk to themselves and the public. The likelihood is great that most of the buildings downtown would be destroyed or severely damaged by a localized earthquake.
Ideas for Implementation:	Complete an assessment on all URM buildings in the downtown business district to identify and prioritize projects for multi-hazard risk reduction. Develop a strategy for funding of URM retrofit projects.
Responsible Office:	Hanford City Manager
Partners:	Hanford Fire Department, Hanford Planning Department, Hanford Building Department, property owners
Potential Funding:	Hazard Mitigation Grant Program, Pre-Disaster Mitigation Program, other federal and state grants, property owners, partnerships with insurance companies
Cost Estimate:	Undetermined
Benefits: (Losses Avoided)	To ensure that corrective action is taken now to prevent the loss of life and property during a large-scale emergency.
Timeline:	Complete assessment and identify funding strategy within five years
Completed by:	Tim Ieronimo, Hanford Fire Department, Chief

Mitigation Action: Hanford #4—Update Building Codes

Action:	Adopt the 2006 International Building Codes to improve disaster-resistance of future buildings.
Jurisdiction:	City of Hanford
Priority:	High
Issue/Background:	The International Building Codes are on a three-year revision cycle. The state of California reviews and modifies the codes. After the review and modifications, the state adopts the codes as required. After the state adopts the code, the City of Hanford will also review and adopt the codes.
Ideas for Implementation:	The planning, building and fire departments will review the appropriate codes for each department and modify as needed. Each department will create the necessary ordinances for City Council adoption.
Responsible Office:	Hanford Planning Department
Partners:	Hanford City Council, Hanford Fire Department, Hanford Building Department
Potential Funding:	In-Kind, Hanford General Fund
Cost Estimate:	This a part of the operating cost for each department.
Benefits: (Losses Avoided)	The adoption of the 2006 International Building Code will improve the ability to avoid losses in the future due the disaster-resistance of future buildings.
Timeline:	Within 90 days of the adoption of the 2006 International Building Codes by the state of California.
Completed by:	Tim Ieronimo, Hanford Fire Department, Chief

Mitigation Action: Hanford #5—Assessment of Critical Facilities

Action:	Assess vulnerability of critical facilities, including police/fire stations, hospitals, schools, and others, to identify and prioritize projects for multi-hazard risk reduction.
Jurisdiction:	City of Hanford
Priority:	High
Issue/Background:	An assessment of the vulnerability of critical facilities in Hanford to hazards, particularly earthquakes, is needed to identify and prioritize projects needed to reduce vulnerabilities.
Ideas for Implementation:	The city of Hanford's planning, building and fire departments will complete a vulnerability assessment of all critical facilities within the city, which will include the police/fire stations, hospitals, schools, and county facilities, to identify and prioritize projects for multi-hazard risk reduction.
Responsible Office:	Hanford Fire Department
Partners:	Planning Department, Building Department, Kings County Fire Department
Potential Funding:	In-Kind, Hanford General Fund
Cost Estimate:	Operating costs in each department's budget.
Benefits: (Losses Avoided)	Ensure that all of the city of Hanford's critical facilities are not vulnerable during a large-scale emergency and take corrective action now to prevent the loss of operations of any critical facility during a large-scale emergency.
Timeline:	One year
Completed by:	Tim Ieronimo, Hanford Fire Department, Chief

Agenda

Kings County Multi-Hazard Mitigation Plan Hazard Mitigation Planning Committee Meeting #3

**March 28, 2007, 9:00 am - 12:00 pm
Hanford, California**

(9:00-9:30)

1) Summarize Key Issues from Risk Assessment

2) Present Goals and Objectives

(9:30-10:45)

3) Review Types of Mitigation Actions

4) Identify Mitigation Actions

Break (15 minutes)

(11:00-12:00)

5) Prioritize Mitigation Actions

6) Next Steps: Develop Project Implementation Details

Sign-In Sheet
Kings County Multi-Hazard Mitigation Plan
Hazard Mitigation Planning Committee Meeting #3
March 28, 2007

Name	Jurisdiction/Department	Address	Phone	E-Mail
Joe Neves	KCBOS			
Les Wright	KC AG Dept.	650N Camps Drive	541 2830	wright@co.ki.us
Rob Williams	City of Avenal	919 SKYLARK BLVD	(559) 386-5766	
Kara Bownds	Kings County Planning		559 582 3211	kbounds@co.ki.
Breeg Sartzka	KC. Planning		Ext 2682	gsartzka@co.ki.
Tawana Ravalin	Kings Co. Official	1144 W. Lacey Blvd.	589-2501	ravalin@king.ki.us
GARY CRAMER	LOREAN PD.	1031 CHITTENDEN	992-5151	gcramer@co.kings.ca.
WES KESLERS	Lemoore PD.	657 FOK ST. LEMOORE	924-9574	WRobertson@co.kings.ca
Keth Seligman	KCRD	4886 E. Jensen Fresno	217-4285	kseligman@krcd.org
Paul Perkins	STATE OFS	2850 UNIVERSITY AVE FRESNO, CA 93727	559-405-5820	Paul@Perkins.org
TRUDY MARETTA	KINGS CO. FIRE/LES			
Sabrina Bustamante	KCRPH			
Debbie Bellu	Julene Bellu RDS	P.O. Box 877	992-5011	dbellu@jgboone.com
Walter Bucci				wbucci@jgboone.com
Tim Rivera	KINGS COUNTY/LES			

Thursday, February 08, 2007

Local input is sought on hazard mitigation

Natural disaster plan is being put in place by county

A multi-hazard mitigation plan is being put into place for Kings County, and Corcoran's part of that plan is an integral piece of the whole. To address local issues and receive input from Corcoran citizens, a public meeting will be held in the city council chambers on Tuesday, Feb. 27, beginning at 6 p.m.

The purpose of the meeting will be to inform the public of the purpose and process of the overall plan; presented the results of Corcoran's risk assessment; and to discuss community assets and public priorities for risk reduction.

Implementation of the plans helps the county and its participating communities, including Corcoran, to better position available resources to address potential natural hazards before they occur, and to maintain eligibility for mitigation funding from the Federal Emergency Management Agency (FEMA).

The plan is being developed by a Hazard Mitigation Planning Committee, with input from the county's cities; county, state and federal agencies; the Tachi Yokut tribe; school districts; special districts; and local stakeholders. The plan will address a comprehensive list of natural hazards, ranging from earthquake and flooding to wildfire, extreme heat and drought—and will assess the likely impacts of these hazards to communities in Kings County. The plan will also set goals and prioritize projects to reduce the impacts of future disasters on people and property in the county.

Nationwide, taxpayers pay billions of dollars annually helping communities, organizations, businesses and individuals recover from disaster. Some natural disasters are predictable and, in

many cases, much of the damage can be reduced or even eliminated. FEMA has targeted natural disaster loss reduction as one of its primary goals. The Disaster Mitigation Act of 2000 requires local governments, including universities and special districts, to have a FEMA-approved hazard mitigation plan to maintain eligibility for certain federal disaster assistance and hazard mitigation funding programs.

Hazard mitigation is defined as any sustained action taken to reduce or eliminate long-term risk to human life and property from hazards. Natural hazard mitigation planning is the process by which natural hazards that threaten a community are identified, their likely impacts are assessed, mitigation goals are set, and appropriate strategies for reducing risk are developed, prioritized and implemented.

The Kings County Office of Emergency Services took the lead on writing the county plan, under the direction of Trudy Maletta. Maletta has drawn on the expertise of consultants with Robert Olsson Associates, Inc., a firm that specializes in hazard mitigation and emergency management. Maletta and the consultants formed the Hazard Mitigation Planning Committee to facilitate development of the plan.

Upon approval by the California Office of Emergency Services and FEMA, the plan will be presented to the Corcoran City Council for formal adoption.

For more information about the project, local residents can contact Maletta in Hanford at 582-3211, extension 2881.



Your Input Is Needed on the Kings County Multi-Hazard Mitigation Plan

The cities of Avenal, Corcoran, Hanford, and Lemoore; Kings County; and the Tachi Yokut tribe are developing a comprehensive Multi-Hazard Mitigation Plan to better position resources to address potential natural hazards **before they occur** and to maintain eligibility for mitigation funding from the Federal Emergency Management Agency (FEMA).

We would like **YOUR** input on this important plan, which must be approved by the Kings County Board of Supervisors, the governing bodies of each participating jurisdiction, the State of California, and FEMA.

The plan will address a comprehensive list of natural hazards – ranging from earthquake and flooding to wildfire, extreme heat, and drought – and will assess the likely impacts of these hazards to communities in Kings County. The plan will also set goals and prioritize projects to reduce the impacts of future disasters on people and property in county.

Each participating jurisdiction will have its own section of the Multi-Hazard Mitigation Plan and its own public meeting to address the community's unique risks, capabilities, and priorities. Your comments and ideas are invited and encouraged at the upcoming public meeting on:

Thursday, March 29, 2007 at 6:30 pm
Kings County Government Center, Chambers of the Board of Supervisors
1400 West Lacey Boulevard, Hanford, CA 93230

The purpose of the meeting is to:

- 1) Inform the public of the purpose and process of the plan,
- 2) Present the results of the Kings County risk assessment, and
- 3) Discuss community assets and public priorities for risk reduction.

Feedback from the meeting will be used to inform the draft plan, which will be available for public review and comment. More information on how to comment on the draft plan will be made available in the future. For more information on this project, contact Trudy Maletta, Emergency Services Coordinator at (559) 582-3211 x2881 or tmaletta@co.kings.ca.us.

Kings County Multi-Hazard Mitigation Planning Project

Public Meeting Questionnaire

1. What are potential issues associated with risk reduction in Kings County related to current and future population, infrastructure, economy, historical resources, and etc?
2. In your opinion, what are important community assets to protect from disaster events?
3. Out of the identified mitigation actions, which three do you think should be the top priorities? (Include numbers of actions from the handout).
4. Other general comments:



Kings County Office of Emergency Services

Kings County Fire Department
280 N. Campus Drive ❖ Hanford, California 93230
☎ (559) 582-3211 extension 2881 FAX (559) 582-8261
Joe Neves, Board of Supervisors, Emergency Services Director

September 6, 2007

TO: Any Interested Parties

Re: Draft Kings County Multi-Hazard Mitigation Plan Available for Review

Kings County; the cities of Avenal, Corcoran, Hanford, and Lemoore; and other special districts have worked together to develop a draft of the Kings County Multi-Hazard Mitigation Plan to better position resources to address potential natural hazards **before they occur** and to maintain eligibility for mitigation funding from the Federal Emergency Management Agency (FEMA).

The plan addresses a comprehensive list of natural hazards—ranging from earthquake and flooding to wildfire, extreme heat, and drought—and assesses the likely impacts of these hazards to communities in Kings County. It also sets goals and prioritizes projects to reduce the impacts of future disasters on people and property in the county.

We encourage you to please review and comment on this important plan, which must be approved by the Kings County Board of Supervisors, the governing bodies of each participating jurisdiction, the State of California, and FEMA. Your comments will be considered by the Hazard Mitigation Planning Committee and incorporated into the plan, as appropriate, as well as documented as part of the planning process.

The draft plan is available for your review at the following locations:

- www.countyofkings.com
- Kings County Fire Department
280 North Campus Drive
Hanford, CA 93230
- Lemoore City Manager
119 Fox Street
Lemoore, CA 93245
- Avenal City Manager
919 Skyline Blvd.
Avenal, CA 93204
- Corcoran Fire Station
1033 Chittenden Ave.
Corcoran, CA 93212

Multi-Jurisdictional Hazard Mitigation Planning Project
September 6, 2007
Page 2

The deadline for public comment on the draft plan is September 14, 2007. Comments may be submitted in one of the following ways:

- Drop off your written comments to:
Trudy Maletta
Kings County Fire Department
- Mail, email, or fax written comments to:
Julie Baxter
AMEC Earth and Environmental
355 South Teller Street, Suite 300
Lakewood, CO 80226
Tel: (303) 742-5324
Fax: (303) 935-6575
Email: julie.baxter@amec.com

If you have questions on this planning project, please contact Trudy at (559) 582-3211 x2881 or trudy.maletta@co.kings.ca.us. Thank you in advance for your input.

Sincerely,

Trudy Maletta
Kings County Office of Emergency Services
Emergency Services Coordinator
280 North Campus Drive
Hanford, CA 93230
Tel: (559) 582-3211 x2881
Email: trudy.maletta@co.kings.ca.us

County's multi-hazard mitigation plan up for review

For The Sentinel

The public is invited and encouraged to comment on a draft version of the Kings County Multi-Hazard Mitigation Plan.

The purpose of this plan is to better position resources to address potential natural hazards before they occur and to maintain eligibility for mitigation funding from the Federal Emergency Management Agency (FEMA).

The plan addresses a comprehensive list of natural hazards — ranging from earthquake and flooding to wildfires, extreme heat and drought — and assesses the likely

impacts of these hazards to communities in Kings County.

It also sets goals and prioritizes projects to reduce the impacts of future disasters on people and property in the county.

The draft plan is available for public review at the following locations: on-line at www.countyofkings.com; the Kings County Fire Department, 280 N. Camps Drive in Hanford; the Corcoran fire station, 1033 Chaucer Ave.; the Lemoore City Manager's office, 119 Fox St.; and the Avaral City Manager's office, 919 Skyline Blvd.

The deadline for public comment on the

draft plan is Sept. 14. Written comments can be dropped off to Trudy Maletta at the

Kings County Fire Department, or mailed, e-mailed or faxed to Julie Baxter at AMEX Earth and Environmental, 255 S. Teller St., Suite 300, Lakewood, CO 80226.

The plan must be approved by the Kings County Board of Supervisors, the governing bodies of each participating jurisdiction, the state of California and FEMA.

Public comments will be considered by the Hazard Mitigation Planning Committee and incorporated into the plan as appropriate. Comments will also be documented as part of the planning process.

APPENDIX C: PROTECTED PLANT AND WILDLIFE SPECIES POTENTIALLY OCCURRING IN KINGS COUNTY

Common Name	Federal/State Status	Potential for Occurrence in Kings County
vernal pool fairy shrimp (<i>Branchinecta lynchi</i>)	Federally Threatened/ None	Restricted to northern claypan vernal pools along Cross Creek. Observed in 1999 approximately 0.6 miles southwest of Burris Park and 0.2 miles north of Cross Creek, 1.6 miles west southwest of where it crosses Highway 99.
valley elderberry longhorn beetle (<i>Desmocerus californicus dimorphus</i>)	Federally Threatened/ None	Evidence of this beetle from a site on the southeast bank of the Kings River at Excelsior Avenue. Elderberry beetle exit holes were found in a stand of elderberries growing two miles north northeast of Hickey Park.
vernal pool tadpole shrimp (<i>Lepidurus packardii</i>)	Federally Endangered/ None	An extant population of vernal pool tadpole shrimp once occupied the northeastern corner of the county near Highway 99. Last observed in 1999 0.2 miles north of Cross Creek, 1.6 miles west southwest of where it crosses Highway 99 and 1.8 miles southeast of the junction of 4 th Ave and Excelsior Ave.
California tiger salamander (<i>Ambystoma californiense</i>)	Federally Threatened/State Species of Concern	Designated critical habitat extends from Tulare County into the eastern corner of Kings County near I-99 north of Goshen. This species has also been observed on the Lemoore Naval Air Station, and on the west side of Cross Creek.
western spadefoot <i>Spea</i> (= <i>Scaphiopus</i>) <i>hammondii</i>	None/State Species of Concern	An extant population of this species has been observed in the northwestern corner of the county near the Fresno County line and in the northeastern corner near I-99 north of Goshen.
California red-legged frog (<i>Rana aurora draytonii</i>)	Federally Threatened/ None	Designated critical habitat extends from San Luis Obispo County into the southwestern-corner of Kings County.
blunt-nosed leopard lizard <i>Gambelia</i> (= <i>Crotaphytus</i>) <i>silva</i>	Federally Endangered/ State Endangered	Found primarily in the grassland/scrub habitats near the Kettleman Hills and Avenal, south of the Tulare Lake Basin, and west of Guernsey. Also found in habitat adjacent to the California Aqueduct.
giant garter snake <i>Thamnophis gigas</i>	Federally Threatened/ None	No recent records from Kings County but it may still occur in the Fresno Slough and in the lower reaches of Kings River.
western pond turtle <i>Emys</i> (= <i>Clemmys</i>) <i>marmorata</i>	None/State Species of Concern	Range is located within the City of Hanford planning area. This species has been known to occur in People's Ditch.
San Joaquin whipsnake <i>Masticophis flagellum ruddocki</i>	None/State Species of Concern	Potentially occurs on Lemoore Naval Air Station.
California condor <i>Gymnogyps californianus</i>	Federally Endangered/ None	Historic range includes alluvial plains and foothills along the western edge of the valley. The release of captive-bred individuals has begun and free-flying birds may return to some of their traditional nesting and foraging areas.

Common Name	Federal/State Status	Potential for Occurrence in Kings County
bald eagle <i>Haliaeetus leucocephalus</i>	Federally Threatened /None	Observed in the vicinity of the Kings River.
white-faced ibis <i>Plegadis chihi</i>	None/State Species of Concern	Observed in the South Wilbur flood area in the southwestern portion of the county.
fulvous whistling-duck <i>Dendrocygna bicolor</i>	None/State Species of Concern	Observed near Dead Pig Pond near the Kings County/Tulare County line.
Swainson's hawk <i>Buteo swainsoni</i>	None/State Threatened	There are roosting and nesting sites north of Corcoran and south of Hamblin. Foraging birds from these nests and transients are closely associated with alfalfa fields, riparian areas, and open woodlands in much of Kings County north of Nevada Avenue and east of 10 th Avenue.
prairie falcon <i>Falco mexicanus</i>	None/State Species of Concern	Found in the southwestern portion of the county near Tar Canyon Road.
western snowy plover <i>Charadrius alexandrinus nivosus</i>	Federally Threatened/State Species of Concern	Restricted almost entirely to ten agricultural drainwater evaporation basins within the Tulare Lake Basin.
burrowing owl <i>Athene unicularia</i>	None/State Species of Concern	A number of burrowing owls have been observed in ground squirrel burrows in native and non-native grassland habitat along the railroad tracks east of the City of Hanford Planning Area several miles west of Goshen.
tricolored blackbird <i>Agelaius tricolor</i>	None/State Species of Concern	Commonly found near Lemoore Naval Air Station off of Grangeville Road.
giant kangaroo rat <i>Dipodomys ingens</i>	Federally Endangered/ State Endangered	Highly restricted occurrence in valley grassland habitat in the vicinity of Avenal Gap near the southern end of the Kettleman Hills. This population may have been extirpated.
Fresno kangaroo rat <i>Dipodomys nitratoides exilis</i>	Federally Endangered/ State Endangered	Highly restricted occurrence in grassland/scrub habitats on Lemoore Naval Air Station property.
Tipton kangaroo rat <i>Dipodomys nitratoides nitratoides</i>	Federally Endangered/ State Endangered	Scattered, widespread distribution, but very low in numbers at any single location. Restricted to Valley Sink Scrub, Valley Saltbush Scrub, and grassland vegetation west of Guernsey, south of Lemoore, east of the California Aqueduct. They also occur in native plant communities south of the Tulare Lake Basin and in the grassland area just north of Corcoran Irrigation District Reservoir. This species also sometimes disperses into fallowed agricultural fields adjacent to its Valley floor habitat.
snort-nosed kangaroo rat <i>Dipodomys nitratoides brevinasus</i>	None/State Threatened	Populations have been observed in the Kettleman Hills.

Common Name	Federal/State Status	Potential for Occurrence in Kings County
Tulare grasshopper mouse <i>Onychomys torridus tularensis</i>	None/State Threatened	Not recently observed within Kings County.
San Joaquin kit fox <i>Vulpes macrotis mutica</i>	Federally Endangered/ State Threatened	Widespread occurrence in native scrub and grassland habitats throughout the valley floor, including occurrences in certain developed areas (City of Hanford, Lemoore Naval Air Station, Kettleman City, Avenal Landfill, and Laton) during traveling and foraging events.
Nelson's antelope squirrel <i>Ammospermophilus nelsoni</i>	None/State Threatened	Last recorded occurrence in 1993 at the Avenal Landfill, also observed on the west side of the intersection of Barker Den Road and 25 th Avenue east of the Kettleman Hills.
San Joaquin wooly threads <i>Monolopia congdonii</i> (= <i>Lembertia congdonii</i>)	Federally Endangered/ None	Scattered, discontinuous distribution in sandy or alkaline clay soil grassland and scrub habitats below 500 feet elevation. Populations are known from the lower slopes of the Kettleman Hills and along the California Aqueduct alignment. Additional populations may occur in native plant communities south of the Tulare Lake Basin.

**APPENDIX D: SCHOOL DISTRICT RESOLUTIONS
AUTHORIZING REPRESENTATION BY THE KINGS COUNTY
OFFICE OF EDUCATION**



ARMONA UNION ELEMENTARY SCHOOL DISTRICT

RESOLUTION NO. 012507-B

RESOLUTION TO JOIN KINGS COUNTY MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

WHEREAS, Armona Union Elementary School District has limited capability to undertake extensive participation in the preparation of a hazard mitigation plan; and

WHEREAS, the Kings County Office of Education is able to act on behalf of Armona Union Elementary School District in the analysis and development of a hazard mitigation plan; and

WHEREAS, the Kings County Office of Education shall prepare a hazard mitigation plan in accordance with FEMA requirements at 44 C.F.R. 201.6; and

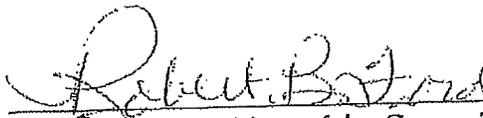
WHEREAS, the Kings County Office of Education shall deliver a draft copy of the Plan for public comment as well as the governing body's comment during the planning process and prior to adoption.

NOW THEREFORE, Armona Union Elementary School District, authorizes Kings County Office of Education to participate in the preparation of the Kings County Multi-Jurisdiction Hazard Mitigation Plan on behalf of Armona Union Elementary School District which shall be reviewed and considered for adoption by Armona Union Elementary School District upon completion.

On motion of Trustee Estes, seconded by Trustee Amos
The following resolution was passed and adopted by the Governing Board on January 25, 2007,
by the following vote:

AYES: Trustees Amos, Estes, Ford and Johnson
NOES:
ABSENT:

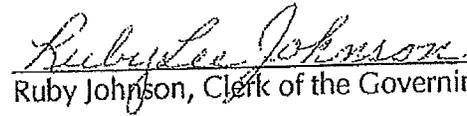
STATE OF CALIFORNIA)
ARMONA UNION ELEMENTARY)
SCHOOL DISTRICT)
COUNTY OF KINGS)
RESOLUTION #012507-B)



Robert Ford, President of the Governing Board



Glenn Estes, Vice President of the Governing Board



Ruby Johnson, Clerk of the Governing Board



Gus Amos, Member of the Governing Board

**BEFORE THE BOARD OF TRUSTEES
OF THE
CORCORAN UNIFIED SCHOOL DISTRICT**
1520 Patterson Ave.
Corcoran, CA 93212

Kings County Office of Education)
Jurisdictional Hazard Mitigation Plan)

RESOLUTION NO. 903

WHEREAS, Corcoran Unified School District has limited capability to undertake extensive participation in the preparation of a hazard mitigation plan; and

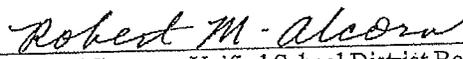
WHEREAS, the Kings County Office of Education is able to act on behalf of Corcoran Unified School District; and

WHEREAS, the Kings County Office of Education shall prepare a hazard mitigation plan in accordance with FEMA requirements at 44 C.F.R. 201.6; and

WHEREAS, the Kings County Office of Education shall deliver a draft copy of the Plan for public comment as well as the governing body's comment during the planning process and prior to adoption.

NOW, THEREFORE, Corcoran Unified School District authorizes Kings County Office of Education to participate in the preparation of the Kings County Multi-Jurisdictional Hazard Mitigation Plan on behalf of Corcoran Unified School District which shall be reviewed and considered for adoption by Corcoran Unified School District upon completion.

ADOPTED this 13th day of February, 2007 at the regular meeting of the Corcoran Unified School District.



Clerk of Corcoran Unified School District Board of Trustees

Resolution #13-07

HANFORD ELEMENTARY SCHOOL DISTRICT
714 N. White Street
Hanford, Ca 93230

DEVELOPMENT OF THE LOCAL HAZARD MITIGATION PLAN (LHMP)

WHEREAS, under new federal requirements, all local jurisdictions, including school districts, must develop a Local Hazard Mitigation Plan (LHMP) to remain eligible to receive federal mitigation funding; and

WHEREAS, the Kings County Office of Education is able to act on behalf of the school districts in Kings County in the analysis and development of a hazard mitigation plan; and

WHEREAS, the Kings County Office of Education shall prepare a hazard mitigation plan in accordance with FEMA requirements at 44 C.F. R. 201.6; and

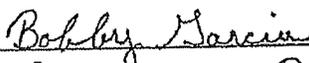
WHEREAS, the Kings County Office of Education shall deliver a draft copy of the Plan for public comment as well as the governing body's comment during the planning process and prior adoption.

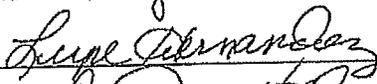
NOW THEREFORE, Hanford Elementary School District Board of Trustees, authorizes Kings County Office of Education to participate in the preparation of the Kings County Multi-Jurisdictional Hazard Mitigation Plan on behalf of Hanford Elementary School District which shall be reviewed and considered for adoption by the Hanford Elementary School District Board of Trustees upon completion.

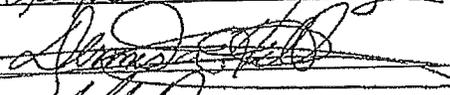
ADOPTED this 17th day of January, 2007 at the meeting of the Hanford Elementary School District Board of Trustees.

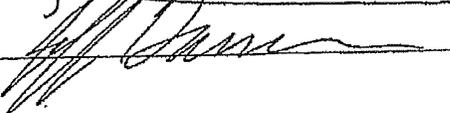
Hanford Elementary School District Board of Trustees











Dated: January 17, 2007

ISLAND UNION ELEMENTARY SCHOOL DISTRICT
7799 21ST AVENUE
LEMOORE, CA 93245

RESOLUTION 2007-2
Governing Board of the
Island Union Elementary School District

Approval of Hazard Mitigation Plan
Prepared by the Kings County Office of Education

WHEREAS, the Island Union Elementary School District has limited capability to undertake extensive participation in the preparation of a hazard mitigation plan; and

WHEREAS, the Kings County Office of Education is able to act on behalf of the Island Union Elementary School District in the analysis and development of a hazard mitigation plan; and

WHEREAS, the Kings County Office of Education shall prepare a hazard mitigation plan in accordance with FEMA requirements at 44 C.F.R. 201.6; and

WHEREAS, the Kings County Office of Education shall deliver a draft copy of the Plan for public comment as well as the governing body's comment during the planning process and prior to adoption.

NOW THEREFORE, the Island Union Elementary School District authorizes Kings County Office of Education to participate in the preparation of the Kings County Multi-Jurisdictional Hazard Mitigation Plan on behalf of the Island Union Elementary School District which shall be reviewed and considered for adoption by the Island Union Elementary School District upon completion.

ADOPTED this 30th day of January 2007, at the meeting of the Island Union Elementary School District Board of Trustees.

Ayes: 3 Absent: 2 Noes: 0 Abstained: 0



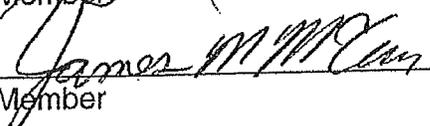
President

Clerk

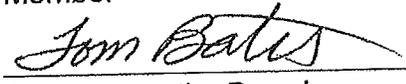


Member

Member



Member



Secretary to the Board

**Kings River-Hardwick School District
10300 Excelsior Avenue
Hanford, CA 93230**

Resolution # 01-30-07-02

WHEREAS, Kings River-Hardwick School District has limited capacity to undertake extensive participation in the preparation of a hazard mitigation plan; and

WHEREAS, the Kings County Office of Education is able to act on behalf of Kings River-Hardwick School District in the analysis and development of a hazard mitigation plan; and

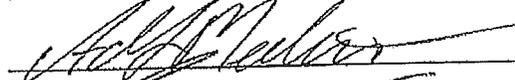
WHEREAS, the Kings County Office of Education shall prepare a hazard mitigation plan in accordance with FEMA requirements at 44 C.F.R. 201.6; and

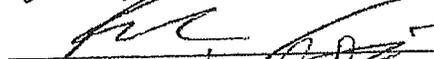
WHEREAS, the Kings County Office of Education shall deliver a draft copy of the Plan for public comment as well as the governing body's comment during the planning process and prior to adoption.

NOW THEREFORE, Kings River-Hardwick School District authorizes Kings County Office of Education to participate in the preparation of the Kings County Multi-Jurisdictional Hazard Mitigation Plan on behalf of Kings River-Hardwick School District that shall be reviewed and considered for adoption by Kings River-Hardwick School District upon completion.

ADOPTED this 30th day of January, 2007 at the meeting of the Governing Board.

BOARD OF TRUSTEES



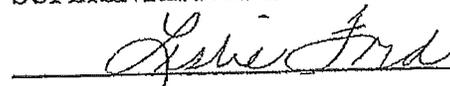


Robert Kohler

Vicki Stangfield



SUPERINTENDENT



RESOLUTION NO. 0607-10
RESOLUTION OF THE GOVERNING BOARD
OF THE
KIT CARSON UNION SCHOOL DISTRICT

AUTHORIZING KINGS COUNTY OFFICE OF EDUCATION TO PARTICIPATE IN THE PREPARATION OF THE KINGS COUNTY MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN ON BEHALF OF KIT CARSON UNION SCHOOL DISTRICT.

WHEREAS, Kit Carson Union School District has limited capability to undertake extensive participation in the preparation of a hazard mitigation plan; and

WHEREAS, Kings County Office of Education is able to act on behalf of Kit Carson Union School District in the analysis and development of a hazard mitigation plan; and

WHEREAS, the Kings County Office of Education shall prepare a hazard mitigation plan in accordance with FEMA requirements at 44 C.F.R. 201.6; and

WHEREAS, the Kings County Office of Education shall deliver a draft copy of the Plan for public comment as well as the governing body's comment during the planning process and prior to adoption.

NOW, THEREFORE, the Kit Carson Union School District Board of Trustees authorizes Kings County Office of Education to participate in the preparation of the Kings County Multi-Jurisdictional Hazard Mitigation Plan on behalf of Kit Carson Union School District, which shall be reviewed and considered for adoption by Kit Carson Union School District Board of Trustees upon completion.

Passed and Adopted at a regular meeting of the KIT CARSON UNION SCHOOL DISTRICT BOARD OF TRUSTEES held on January 17, 2007 by the following vote:

AYES:	<u>5</u>
NOES:	<u>0</u>
ABSENT:	<u>0</u>
ABSTAIN:	<u>0</u>

I, Theresa Barbeiro, the President of the Governing Board of the Kit Carson Union School District, hereby certify that the foregoing is a true and correct copy of a Resolution duly made, adopted and entered in the Board minutes of the Governing Board meeting on the 17th of January, 2007.


Theresa Barbeiro, President
Kit Carson Board of Trustees

**Resolution A020707
Participation for Kings County
Hazard Mitigation Plan**

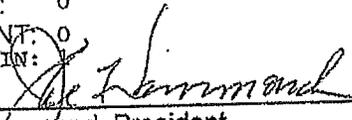
WHEREAS, the Kings County Office of Education shall prepare a hazard mitigation plan in accordance with FEMA requirements at 44 C.F.R. 201.6; and

WHEREAS, the Kings County Office of Education shall deliver a draft copy of the Plan for public comment as well as the governing body's comment during the planning process and prior to adoption.

NOW THEREFORE, The Kings County Board of Education, authorizes Kings County Office of Education staff to participate in the preparation of the Kings County Multi-Jurisdictional Hazard Mitigation Plan which shall be reviewed and considered for adoption by the Kings County Board of Education upon completion.

PASSED AND ADOPTED this 7th day of February 2007, by the following votes:

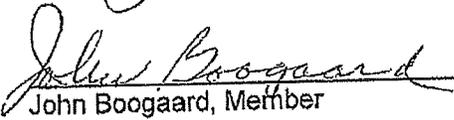
AYES: 4
NOES: 0
ABSENT: 0
ABSTAIN: 0



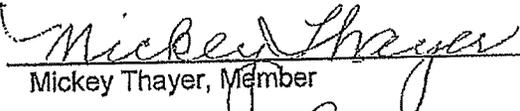
Joe Hammond, President



Bill Gundacker, Vice President

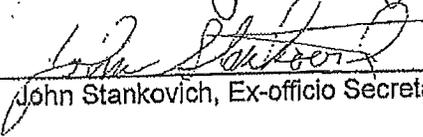


John Boogaard, Member



Mickey Thayer, Member

Jim Kilner, Member



John Stankovich, Ex-officio Secretary

**BEFORE THE GOVERNING BOARD
OF THE
LAKESIDE UNION ELEMENTARY SCHOOL DISTRICT**

**In the matter of
Local Hazard Mitigation Plan (LHMP)**

**RESOLUTION
No. 07-06**

WHEREAS, the Lakeside Union Elementary School District has limited capability to undertake extensive participation in the preparation of a hazard mitigation plan; and

WHEREAS, the Kings County Office of Education is able to act on behalf of Lakeside Union Elementary School District in the analysis and development of a hazard mitigation plan; and

WHEREAS, the Kings County Office of Education shall prepare a hazard mitigation plan in accordance with FEMA requirements at 44 C.F.R. 201.6; and

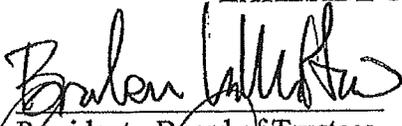
WHEREAS, the Kings County Office of Education shall deliver a draft copy of the Plan for public comment as well as the governing body's comment during the planning process and prior to adoption.

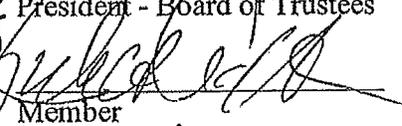
NOW, THEREFORE, BE IT RESOLVED that the Lakeside Union Elementary School District authorizes Kings County Office of Education to participate in the preparation of the Kings County Multi-Jurisdictional Hazard Mitigation Plan on behalf of Lakeside Union Elementary School District which shall be reviewed and considered for adoption by Lakeside Union Elementary School District upon completion.

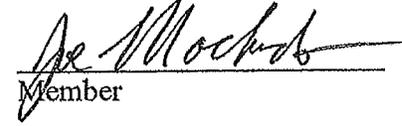
The foregoing Resolution was adopted upon the motion of Trustee Joe Machado seconded by Trustee Judy Horn, at a regular meeting on this 8th day of February, 2007 by the following vote:

Ayes: 3 Noes: 0 Abstains: 0 Absent: 2

LAKESIDE UNION ELEMENTARY SCHOOL DISTRICT

Acting 
President - Board of Trustees


Member


Member

Clerk

Member

BEFORE THE BOARD OF TRUSTEES OF THE
LEMOORE UNION ELEMENTARY SCHOOL DISTRICT
COUNTY OF KINGS, STATE OF CALIFORNIA

RESOLUTION NO. 021307C

KINGS COUNTY OFFICE OF EDUCATION AUTHORIZED REPRESENTATIVE FOR
KINGS COUNTY MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

WHEREAS, Lemoore Union Elementary School District ("District") has limited capability to undertake extensive participation in the preparation of a hazard mitigation plan; and

WHEREAS, the Kings County Office of Education is able to act on behalf of District in the analysis and development of a hazard mitigation plan; and

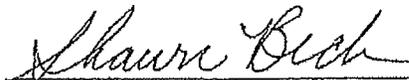
WHEREAS, the Kings County Office of Education shall prepare a hazard mitigation plan in accordance with FEMA requirements at 44 C.F.R. 201.6; and

WHEREAS, the Kings County Office of Education shall deliver a draft copy of the Plan for public comment as well as the governing body's comment during the planning process and prior to adoption.

NOW THEREFORE, District Board of Trustees ("District Board"), authorizes Kings County Office of Education to participate in the preparation of the Kings County Multi-Jurisdictional Hazard Mitigation Plan on behalf of District which shall be reviewed and considered for adoption by District Board upon completion.

THE FOREGOING RESOLUTION WAS ADOPTED upon motion of Trustee Jim Inglis, seconded by Trustee Tim Wahl, at a regular meeting on this 13th day of February, 2007, by the following vote:

Ayes: 5
Noes: 0
Abstain: 0
Absent: 0



Shawn Beck, Clerk of the Board
Lemoore Union Elementary School District

IX-A-2

LEMOORE UNION HIGH SCHOOL DISTRICT

PAUL J. TERRY, Ed.D.
District Superintendent

5 Powell Avenue
Lemoore, CA 93245-3601
(559) 924-6610 FAX (559) 924-9212
www.luhisd.k12.ca.us

HARRY SUSSMAN
Assistant Superintendent
Of Curriculum & Instruction

BEFORE THE BOARD OF TRUSTEES OF THE
LEMOORE UNION HIGH SCHOOL DISTRICT
5 POWELL AVENUE, LEMOORE, CALIFORNIA 93245
COUNTY OF KINGS, STATE OF CALIFORNIA

IN THE MATTER OF HAZARD MITIGATION PLAN

RESOLUTION NO. 07-02

WHEREAS, the Lemoore Union High School District has limited capability to undertake extensive participation in the preparation of a hazard mitigation plan; and

WHEREAS, the KINGS COUNTY OFFICE OF EDUCATION is able to act on behalf of the Lemoore Union High School District in the analysis and development of a hazard mitigation plan; and

WHEREAS, the KINGS COUNTY OFFICE OF EDUCATION shall prepare a hazard mitigation plan in accordance with FEMA requirements at 44 C.F.R. 201.6; and

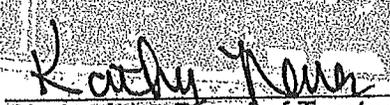
WHEREAS, the KINGS COUNTY OFFICE OF EDUCATION shall deliver a draft copy of the Plan for public comment as well as the governing body's comment during the planning process and prior to adoption.

NOW, THEREFORE, the Lemoore Union High School District authorizes KINGS COUNTY OFFICE OF EDUCATION to participate in the preparation of the Kings County Multi-Jurisdictional Hazard Mitigation Plan on behalf of the Lemoore Union High School District which shall be reviewed and considered for adoption by the Lemoore Union High School District upon completion.

ADOPTED this 22nd day of February, 2007 at the regular meeting of the Lemoore Union High School District. The foregoing resolution was adopted upon motion by Trustee Kathy Neves, seconded by Trustee Noah Lawson, by the following vote:

AYES: 4
NOES: 0
ABSENT: 0

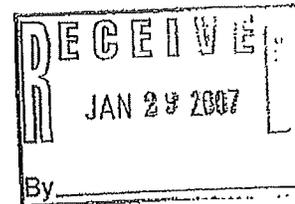

President of the Board of Trustees
Lemoore Union High School District


Clerk of the Board of Trustees
Lemoore Union High School District

TRUSTEES

John Giovannetti • Lois Hubanks • Noah Lawson • Kathy Neves • Gary L. Sedgwick

Reef-Sunset Unified School District
Board of Trustees
205 N. Park Ave.; Avenal, CA 93204



Resolution: 2007: 01

WHEREAS, Reef-Sunset Unified School district has limited capability to undertake extensive participation in the preparation of a hazard mitigation plan; and

WHEREAS, the Kings County Office of Education is able to act on behalf of Reef-Sunset Unified School District in the analysis and development of a hazard mitigation plan; and

WHEREAS, the Kings County Office of Education shall prepare a hazard mitigation plan in accordance with FEMA requirements at 44 C.F.R. 201.6; and

WHEREAS, the Kings County Office of Education shall deliver a draft copy of the Plan for public comment as well as the governing body's comment during the planning process and prior to adoption.

NOW THEREFORE, the Board of Trustees, authorizes Kings County Office of Education to participate in the preparation of the Kings County Multi-Jurisdictional Hazard Mitigation Plan on behalf of Reef-Sunset Unified School District which shall be reviewed and considered for adoption by the Board of Trustees upon completion.

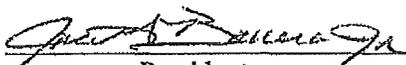
ADOPTED this 18th day of January, 2007 at the meeting of the Board of Trustees.

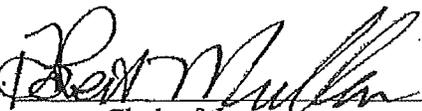
AYES: 5

NOES: 0

ABSENT: 0

REEF-SUNSET UNIFIED SCHOOL DISTRICT

By 
President
Board of Trustees

Attest 
Clerk of the
Board of Trustees



ANNEX E: CITY OF LEMOORE



COMMUNITY PROFILE

Lemoore is governed by a five-member city council that is responsible for approving all legislation and formulating city policies. The council selects one of its members to serve as the mayor, who presides at meetings and represents the city in all official matters and at official functions.

Geography and Climate

Lemoore is located in the San Joaquin Valley in the northeast portion of Kings County. According to the U.S. Census Bureau, the city encompasses 8.4 square miles. The terrain is relatively flat and underlain by well-drained, sandy loam soils. The elevation of the city is 221 feet above sea level. Precipitation averages about 8.4 inches per year. Average high temperature in the summer is 97°F and in the winter is 50°F. The Kings River is located to the west of Lemoore between the city and the Lemoore Naval Air Station.

History

Dr. Lovern Lee Moore first made his home in what was western Tulare County, California (now the city of Lemoore) in April 1871. It was near Tulare Lake, then the largest body of water in central California. By the time Moore arrived, scores of individual farms (mostly sheep and grain) dotted the landscape. Moore brought together the surrounding farm families and secured a post office and a local center for conducting business. Moore also established the first real estate development in the district and laid out and named the streets. Lemoore became an incorporated city on July 11, 1900.

Economy

Lemoore's major employers are still rooted in agriculture; however, economic development in the city created a boom in housing construction. The Lemoore Naval Air Station is the Navy's newest and largest master jet air station projects and is home to the Pacific Strike Fighter Wing and its supporting facilities. The station projects an increase in base personnel through 2010. The future completion of the State Route 41 widening project is expected to allow Fresno commuters a 30-minute drive to Lemoore, expanding the pool of eligible workers (Kings County 2004). Major employers in Lemoore include SK Foods and Leprino Foods processing plants. Lemoore is also home to the newest campus of West Hills Community College.

Population

Lemoore's estimated 2006 population is 23,338. This represents a 19 percent increase over the population at the time of the 2000 U.S. Census (California Department of Finance 2006). Lemoore's population is 59 percent white, 7 percent black or African American, and 17 percent "some other race." Census data indicates that 31 percent of Lemoore's population is of Hispanic origin (U.S. Census Bureau 2000).

HAZARD IDENTIFICATION AND PROFILES

Representatives from the city of Lemoore identified natural hazards that could affect the city and developed hazard profiles based upon the countywide risk assessment and past events and their impacts. Definitions for the rankings used can be found in Chapter 3.

Table E.1: City of Lemoore—Hazard Profiles

Hazard	Probability of Occurrence	Spatial Extent	Potential Magnitude	Significance
Dam Failure	Unlikely	Extensive	Catastrophic	Medium
Drought	Occasional	Extensive	Limited	Medium
Earthquake	Occasional	Extensive	Critical	High
Extreme Heat	Highly Likely	Extensive	Limited	Medium
Flood	Occasional	Limited	Limited	Low
Fog	Highly Likely	Extensive	Negligible	Medium
Freeze	Likely	Extensive	Negligible	Medium
Landslide	Unlikely	Limited	Negligible	Low
Soil Hazards: Expansive Liquefaction Erosion	Occasional	Limited	Negligible	Low
Tornado	Occasional	Limited	Limited	Low
Wildfire	Unlikely	Limited	Negligible	Low

VULNERABILITY ASSESSMENT

The vulnerability assessment analyzes the population, property, and other assets at risk to natural hazards. This section lists Lemoore’s assets at risk, including critical facilities and infrastructure; historic, cultural, and natural resources; and economic assets.

Assets at Risk

The table that follows lists the critical facilities and other community assets identified by representatives from Lemoore as important to protect in the event of a disaster.

Table E.2: City of Lemoore—Critical Facilities and other Community Assets

Facility	Replacement Value	Occupancy/Capacity
Fire Station – 210 Fox Street	\$3,500,000	
Police Station – 657 Fox Street	\$1,718,000	
Lemoore High School – 101 Bush Street	\$72,200,000	
Liberty Middle School – 1000 Liberty Drive	\$32,000,000	
Mary Immaculate Queen School – 884 N. Lemoore Avenue	\$18,000,000	
Meadow Lane Elementary – Quandt and Meadow Lane	\$18,000,000	
Cinnamon Elementary – 500 E. Cinnamon	\$18,000,000	

Annex E: City of Lemoore

Facility	Replacement Value	Occupancy/Capacity
Lemoore Elementary – 573 Bush Street	\$18,000,000	
Engvall Elementary – 19 th and Cedar Lane	\$18,000,000	
Kings Christian School – 900 East D Street	\$18,000,000	
Cinnamon Municipal Complex – 711 Cinnamon Drive	\$10,300,000	
City Hall / Civic Auditorium – 119 Fox Street	\$4,656,000	
Highway 198 Infrastructure / Overpasses	California Department of Transportation	
Highway 41 Infrastructure / Overpasses	California Department of Transportation	
San Joaquin Valley Railroad		
Water wells and storage facilities		19.15Mgal/day
Lemoore Old Post Office	\$1,000,000	
Sarah Mooney Museum	\$600,000	
Leprino Foods	\$86,000,000 (two facilities combined)	

Estimating Potential Losses

Table E.3 shows Lemoore's total exposure to hazards in terms of population and the number and values of structures. Kings County Assessor's data was used to calculate the improved value of parcels. GIS was used to quantify the number and value of structures in the 100-year (Zone A) and 500-year (X-500) flood hazard areas mapped by FEMA. More information on how these estimates were calculated can be found in the Vulnerability Assessment section in Chapter 3.

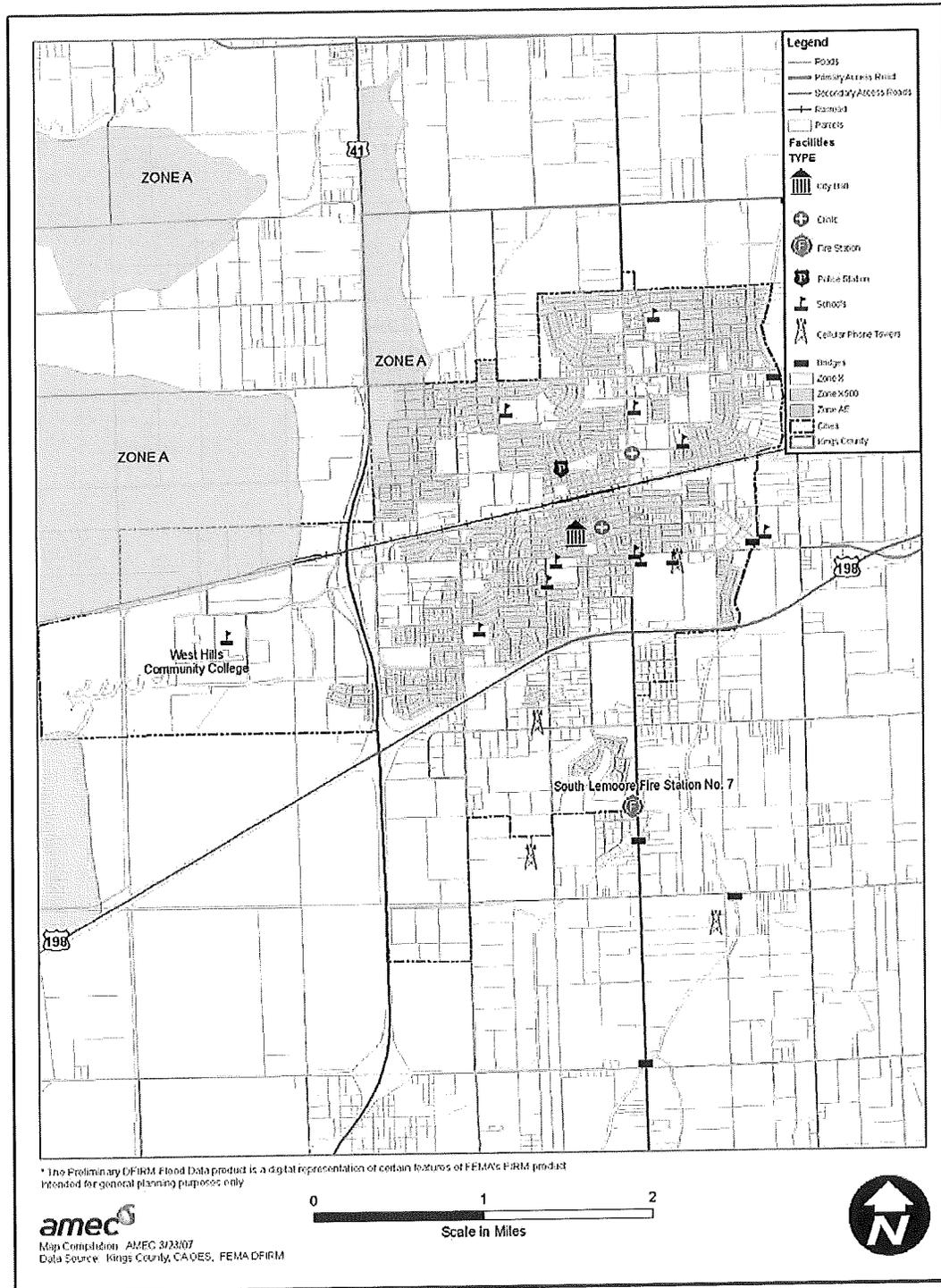
Table E.3: City of Lemoore—Exposure to Hazards

Lemoore	Population	Buildings	Value
Total Exposure (Earthquake)	23,388	5,913	\$853,282,697
Flood: Zone A		0	*0
Flood: X-500		203	*\$31,125,037
Wildfire: Very High Threat	0	0	0

*Leprino Foods Company is excluded from estimation but parcel is on fringe of FEMA Flood Zone A with improved value of \$63,679,451.

Representatives from Lemoore discussed the impacts of different hazards to the city and determined that the impacts from drought, earthquake, extreme heat, fog, and freezes affect the city similar to other areas of the Kings County region and do not differ significantly to the descriptions found in the risk assessment in Chapter 3. The Rowley Dunn Dairy is located in the mapped 100-year floodplain. No critical facilities are located there. Some areas in northwest corner of city are located in the mapped 100-year floodplain. There are no completed or proposed flood protection measures in the city.

Figure E.1: Lemoore Flood Hazards



Future Development Trends

The City of Lemoore 2030 General Plan plans for 24,860 new residents over the next 23 years, which represents an annual growth rate of 3.1 percent. It plans for the majority of new residents to live in new residential neighborhoods in the northern, southern, and eastern part of the city, avoiding the flood hazard areas to the west and northwest. However, the city's undeveloped, northwestern industrial complex lies in a 100-year floodplain.

CAPABILITY ASSESSMENT

Capabilities are the programs and polices currently in use to reduce hazard impacts or that could be used to implement hazard mitigation activities. The assessment is divided into four sections: regulatory, administrative and technical, fiscal, and outreach and partnerships.

Regulatory Capability

Table E.4 lists planning and land management tools typically used by local and tribal jurisdictions to implement hazard mitigation activities and indicates those that are in place in Lemoore.

Table E.4: City of Lemoore—Regulatory and Planning Capabilities

Regulatory Tool	Yes/No	Comments
General plan	Yes	Currently being revised; approval likely in October 2007
Zoning ordinance	Yes	
Subdivision ordinance	Yes	
Site plan review requirements	Yes	
Growth management ordinance	Yes	
Floodplain ordinance	Yes	
Other special purpose ordinance (stormwater, water conservation, wildfire)	Yes	Stormwater and water conservation plans
Building code	Yes	2001 California Building Code parts 1 and 2 referencing the 1997 Uniform Building Code
Fire department ISO rating	Yes	
Erosion or sediment control program	Yes	
Stormwater management program	Yes	
Capital improvements plan	Yes	
Economic development plan	Yes	
Local emergency operations plan	Yes	

Administrative and Technical Capability

The table below identifies the personnel resources responsible for activities related to mitigation and loss prevention in Lemoore. A summary of technical resources follows.

Table E.5: City of Lemoore—Personnel Capabilities

Personnel Resources	Department/Position
Planner/Engineer with knowledge of land development/land management practices	Contracted city engineer from Quad Knopf Consulting
Engineer/Professional trained in construction practices related to buildings and/or infrastructure	Contracted city engineer from Quad Knopf; Public Works – Construction Superintendent
Full time building official	Public Works– Director
Floodplain Manager	Planning – Chief Planner
Emergency Manager	Police Department – Police Chief
Grant writer	Various departments
Other	

Fiscal Capability

The following table identifies financial tools or resources that the city could potentially use to help fund mitigation activities. There are currently no specific funding sources for hazard mitigation.

Table D.6: City of Lemoore—Available Financial Tools and Resources

Financial Resources	Accessible/ Eligible to Use
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	Yes

Outreach and Partnerships

The city could not identify any public outreach or other community partnerships related to hazard mitigation.

GOALS AND OBJECTIVES

The city of Lemoore adopts the hazard mitigation goals and objectives developed by the Hazard Mitigation Planning Committee and described in Chapter 4.

MITIGATION ACTIONS

The planning team for the city of Lemoore identified and prioritized the following mitigation actions based on the risk assessment. Background information as well as information on how the action will be implemented and administered, such as ideas for implementation, responsible office, partners, potential funding, estimated cost, and timeline also are described.

Mitigation Action: Lemoore #1—Long-Term Water Supplies

Action:	Improve coordination, planning, and investment in long-term water supplies to meet demands of ongoing growth and development and mitigate the impacts of drought.
Jurisdiction:	City of Lemoore
Priority:	High
Issue/Background:	The city of Lemoore has sustained managed growth in the incorporated area. The available water from local wells is at or near acceptable federal limits. These limits are expected to change and become more stringent in the near future, and the city may have problems complying with water availability requirements. In addition, increased supply is needed for times of drought and for other emergency events.
Ideas for Implementation:	Install new wells to meet U.S Environmental Protection Agency water standards
Responsible Office:	Lemoore Department of Public Works
Partners:	Kings County
Potential Funding:	Revenue from current water billing customers
Cost Estimate:	Unknown
Benefits: (Losses Avoided)	Increased availability of safe drinking water during drought and other emergency events
Timeline:	Five to ten years
Completed by:	Wes Roberts, Lemoore Police Department, Sergeant

Mitigation Action: Lemoore #2—Assessment of Critical Infrastructure

Action:	Assess vulnerability of critical infrastructure and lifeline utilities, including water distribution systems, to identify and prioritize projects for multi-hazard risk reduction.
Jurisdiction:	City of Lemoore
Priority:	High
Issue/Background:	Public agencies need to constantly evaluate and plan for improvements that deliver the best service level available while remaining cost effective. With the advent of new techniques and technology to evaluate and identify weak links within the infrastructure of city services to further strengthen and mitigate shortages in design and/or function.
Ideas for Implementation:	Evaluate systems starting with water storage and distribution system. Once weaknesses are identified, potential projects for addressing them will be identified, prioritized for funding, and integrated into the city's capital improvements plan, water master plan, and other relevant plans.
Responsible Office:	Lemoore Office of the City Manager
Partners:	All city department directors
Potential Funding:	Hazard Mitigation Grant Program, Pre-Disaster Mitigation Program, other U.S. Department of Homeland Security grant programs, current city revenue for services
Cost Estimate:	
Benefits: (Losses Avoided)	Prevent damages and losses due to interruptions in services.
Timeline:	Five years
Completed by:	Wes Roberts, Lemoore Police Department, Sergeant

Mitigation Action: Lemoore #3—Assessment of Critical Facilities

Action:	Assess vulnerability of critical facilities, including police/fire stations, hospitals, schools, and others, to identify and prioritize projects for multi-hazard risk reduction
Jurisdiction:	City of Lemoore
Priority:	High
Issue/Background:	Various buildings within the city have been upgraded through the years to mitigate potential hazard due to earthquake. There is a need for all buildings to be periodically checked and improved when deficiencies are identified.
Ideas for Implementation:	<ul style="list-style-type: none">• Implement a time schedule for building inspection(s)• Prioritize repair and/or upgrade of buildings found needing such repairs• Implementation of 2006 building code
Responsible Office:	Lemoore Department of Public Works
Partners:	
Potential Funding:	City general budget for planning and prioritizing, Hazard Mitigation Grant Program and Pre-Disaster Mitigation Program for retrofitting/upgrading buildings
Cost Estimate:	
Benefits: (Losses Avoided)	Potential reduction in structural losses due to natural events, such as earthquakes.
Timeline:	Ongoing
Completed by:	Wes Roberts, Lemoore Police Department, Sergeant

Annex E: City of Lemoore

Mitigation Action: Lemoore #4—Public Education

Action:	Develop and implement a comprehensive strategy to improve ongoing public education regarding natural hazards and risk.
Jurisdiction:	City of Lemoore
Priority:	High
Issue/Background:	The lack of public knowledge about hazards and preparedness was identified in this planning process as an important issue to address. Providing public information and training on hazards, risks, and individual and household preparedness could greatly reduce losses during emergency events.
Ideas for Implementation:	Establish training and information that can be delivered through presentations to the widest variety of groups and media Educate citizens about risks in Lemoore and Kings County Encourage families to have kits, plans, and drills to test their plans. Establish a Citizen Emergency Response Team (CERT) program in the city, which would be integrated with the county's program
Responsible Office:	Police Department
Partners:	City of Lemoore (Council and Staff) , local businesses, schools, church and service groups, media
Potential Funding:	Hazard Mitigation Grant Program, Pre-Disaster Mitigation Program, U.S. Department of Homeland Security grants, private foundation grants, California Office of Emergency Services
Cost Estimate:	To be determined at time of grant requests
Benefits: (Losses Avoided)	<ul style="list-style-type: none">• Potentially fewer lives lost and property damaged due to improved community preparedness• Quicker recovery of community due to prior preparation
Timeline:	Implement program within two years
Completed by:	Wes Roberts, Lemoore Police Department, Sergeant

Mitigation Action: Lemoore #5—Vulnerable Populations

Action:	Develop a program or system for supporting vulnerable populations during emergency events
Jurisdiction:	City of Lemoore
Priority:	High
Issue/Background:	There are currently few or no mechanisms in place to assist vulnerable populations in Lemoore during emergency events. Many citizens within these groups are unidentified.
Ideas for Implementation:	<ul style="list-style-type: none">• Work with local agencies, businesses, and nonprofit groups that have contact with specific populations to identify issues and potential strategies to reduce risk to vulnerable populations during emergencies.• Contact other municipalities to obtain their answers to this situation and integrate success stories in our action plan.• Integrate program with the emergency operations plan, perhaps as an annex.
Responsible Office:	Lemoore Parks and Recreation Department
Partners:	All departments within the city of Lemoore
Potential Funding:	State and federal councils on aging, nonprofit organizations, Lemoore General Fund, in-kind/staff time
Cost Estimate:	
Benefits: (Losses Avoided)	<ul style="list-style-type: none">• Improved emergency response capabilities• Reduced risk to vulnerable populations during emergency events
Timeline:	Program will be developed and implemented within two years
Completed by:	Wes Roberts, Lemoore Police Department, Sergeant

Mitigation Action: Lemoore #6—Municipal GIS Program

Action:	Assist in establishing a centralized, inter-jurisdictional GIS program in partnership with the County of Kings to improve all phases of emergency management.
Jurisdiction:	City of Lemoore
Priority:	Medium
Issue/Background:	Lemoore has identified the need for implementation of GIS in all phases of emergency management. The implementation will provide for a timelier response to the needs of our community and improved understanding of hazards and vulnerabilities.
Ideas for Implementation:	<ul style="list-style-type: none">• Purchase technical equipment to use technology• Improve staff capabilities• Obtain training for emergency personnel to optimize benefits of GIS during emergency events
Responsible Office:	Planning Department
Partners:	Kings County Planning Department, Cities of Hanford, Corcoran, Avenal, and Tachi Tribal Council
Potential Funding:	Grant money from FEMA/Department of Homeland Security, ESRI
Cost Estimate:	\$20,000 to contract with county GIS services in fiscal year 2007-2008. Additional costs for equipment and training needs.
Benefits: (Losses Avoided)	<ul style="list-style-type: none">• Better use of available resource• Improved risk assessment• Quicker assessment during emergencies
Timeline:	Establish GIS support agreement with county in fiscal year 2007-2008. Aerial imagery update in summer 2007. Web application in fiscal year 2007-2008.
Completed by:	Wes Roberts, Lemoore Police Department, Sergeant

Mitigation Action: Lemoore #7—Kings County Disaster Council

Action:	Support and enhance membership and responsibilities of existing Kings County Disaster Council to improve countywide coordination and the monitoring and implementation of the mitigation plan.
Jurisdiction:	City of Lemoore
Priority:	Medium
Issue/Background:	The Kings County Disaster Council was established several years ago. The council has since discontinued having regular meetings. The need for re-establishing this committee was discussed and found to be in the best interest of all city and county agencies.
Ideas for Implementation:	Lemoore's City Council and city departments will work with the Kings County Board of Supervisors to resume regular committee meetings.
Responsible Office:	City representative designated by City Manager. (Currently Sergeant Wes Roberts of the Police Department)
Partners:	Kings County Board of Supervisors; state, county, and city agencies located in the county; private sector; and nonprofit agencies
Potential Funding:	In-Kind, Lemoore General Fund
Cost Estimate:	
Benefits: (Losses Avoided)	<ul style="list-style-type: none">• Increased communication and coordination of emergency services prior to and during emergency events to serve the citizens of Kings County• Coordinate and monitor mitigation activities in the county
Timeline:	Resume regular meetings within one year; then ongoing
Completed by:	Wes Roberts, Lemoore Police Department, Sergeant

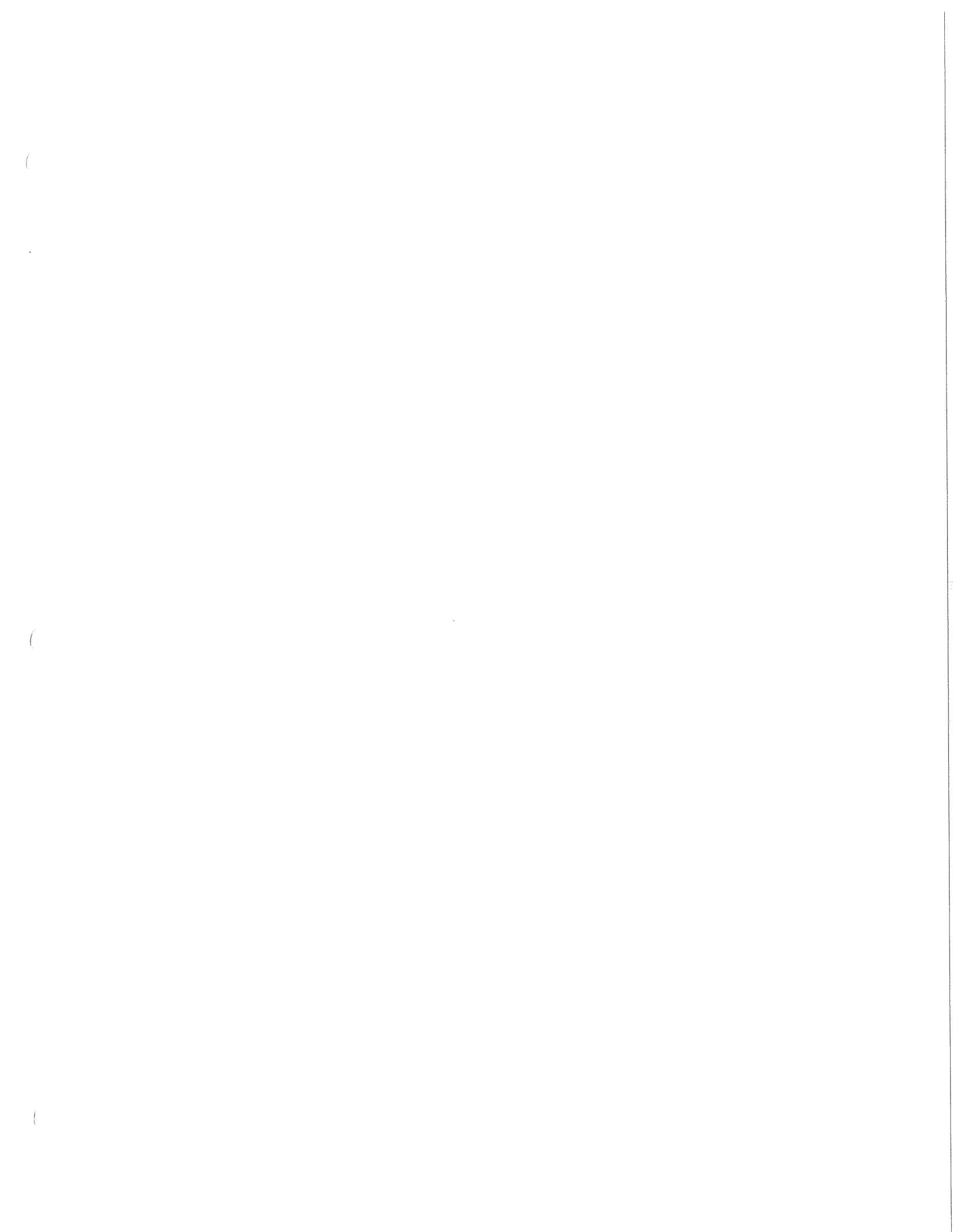
Mitigation Action: Lemoore #8—Adoption of DFIRMs

Action:	Update floodplain management ordinances to include new FEMA digital flood insurance rate maps.
Jurisdiction:	City of Lemoore
Priority:	Low
Issue/Background:	Preliminary digital flood insurance rate maps (DFIRMs) have been developed for all of Kings County; approval is expected within the year. The city's current floodplain ordinance adopts the old FIRM.
Ideas for Implementation:	Update current floodplain program to include new FEMA digital flood insurance rate maps
Responsible Office:	Lemoore Planning Office
Partners:	Lemoore Department of Public Works
Potential Funding:	In-Kind, Lemoore General Fund
Cost Estimate:	
Benefits: (Losses Avoided)	Floodplain ordinance and plan would be updated to most federal standards
Timeline:	Within six months of map approval by FEMA
Completed by:	Wes Roberts, Lemoore Police Department, Sergeant

Annex E: City of Lemoore

Mitigation Action: Lemoore #9—2006 International Building Code

Action:	Adopt the 2006 International Building Code to improve disaster-resistance of future buildings and development in Lemoore.
Jurisdiction:	City of Lemoore
Priority:	Low
Issue/Background:	The City of Lemoore is currently in the process of adopting the 2006 International Building Code.
Ideas for Implementation:	Continue with the Council action currently in progress to adopt this edition of the building code.
Responsible Office:	Lemoore City Council
Partners:	Lemoore Department of Public Works
Potential Funding:	In-kind, Lemoore General Fund
Cost Estimate:	
Benefits: (Losses Avoided)	<ul style="list-style-type: none">• Standards are set to improve disaster-resistance to new construction and upgrades to past construction• Reduce injuries and property damage through safer buildings
Timeline:	One year
Completed by:	Wes Roberts, Lemoore Police Department, Sergeant



ANNEX F: ARMONA COMMUNITY SERVICES DISTRICT

DISTRICT PROFILE

The Armona Community Services District (CSD) was established in 1928. The district currently provides the following services to the local community: water, sewer, and solid waste collection. The district is located within the area bounded by Grangeville Avenue on the north, 13th Avenue on the east, Houston Avenue on the south, and 141/2 Avenue on the west. Currently, approximately 4,000 people live within the district, which is governed by a five-member board elected at-large from within the district. See the countywide map on page 4, in Chapter 1 for the location of Armona.

HAZARD IDENTIFICATION

Representatives from the Armona CSD identified hazards that affect the district based upon the countywide risk assessment and past history.

Table F.1: Armona CSD—Hazard Profiles

Hazard	Significance and Impacts
Dam Failure	Low
Drought	Medium, water quality and quantity issue
Earthquake	Low
Extreme Heat	Medium, water production problems
Flood	Low
Fog	Medium, transportation problems
Freeze	Low
Landslide	Low
Soil Hazards: Expansive, Liquefaction, Erosion	Low
Tornado	Low
Wildfire	Low

Past Events

There is no available data on the impacts of past events to the Armona CSD.

VULNERABILITY ASSESSMENT

The table that follows lists the critical facilities and other district assets identified by representatives from the Armona CSD as important to protect in the event of a disaster.

Annex F: Armona Community Services District

Table F.2: Armona CSD—Critical Facilities and other Assets

Facility	Replacement Value	Replacement Value of Contents	Structure Use and Function Loss
Water well #1	\$2,500,000	\$250,000	Water production
Water well #2	\$1,250,000	\$100,000	Water production
Wastewater treatment plant	\$3,000,000	\$100,000	Wastewater treatment
Office/shop	\$150,000	\$80,000	District administration

Development Trends

There are no planned new developments or improvements at this time.

CAPABILITY ASSESSMENT

Representatives of the Armona CSD assessed the district's current capabilities to reduce risk to natural hazards. The district has a contract engineer trained in construction practices related to buildings and infrastructure. Other administrative and technical capabilities are supported through Kings County, such as GIS, planning, and emergency management.

The district primarily obtains funding by collecting user fees for water and wastewater services. The table below indicates the funding resources available to the district. There are currently no specific funding sources for hazard mitigation.

Table F.3: Armona CSD—Fiscal Capabilities

Financial Resources	Accessible/Eligible to Use
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
Incur debt through general obligation bonds	No
Incur debt through special tax bonds	Yes
Incur debt through private activities	Yes

The Armona CSD is not involved in any public education or outreach programs, nor have they implemented past projects or programs to protect critical facilities or reduce future losses.

GOALS AND OBJECTIVES

The Armona CSD adopts the hazard mitigation goals and objectives developed by the Kings County Hazard Mitigation Planning Committee and adds the following goal of the district:

Annex F: Armona Community Services District

- Minimize damage to critical facilities and interruption in services due to natural hazard events.

MITIGATION ACTIONS

The Armona CSD identified and prioritized the following mitigation actions based on the risk assessment. Background information, as well as information on how the action will be implemented and administered, such as ideas for implementation, responsible office, partners, potential funding, estimated cost, and timeline, also are described.

Annex F: Armona Community Services District

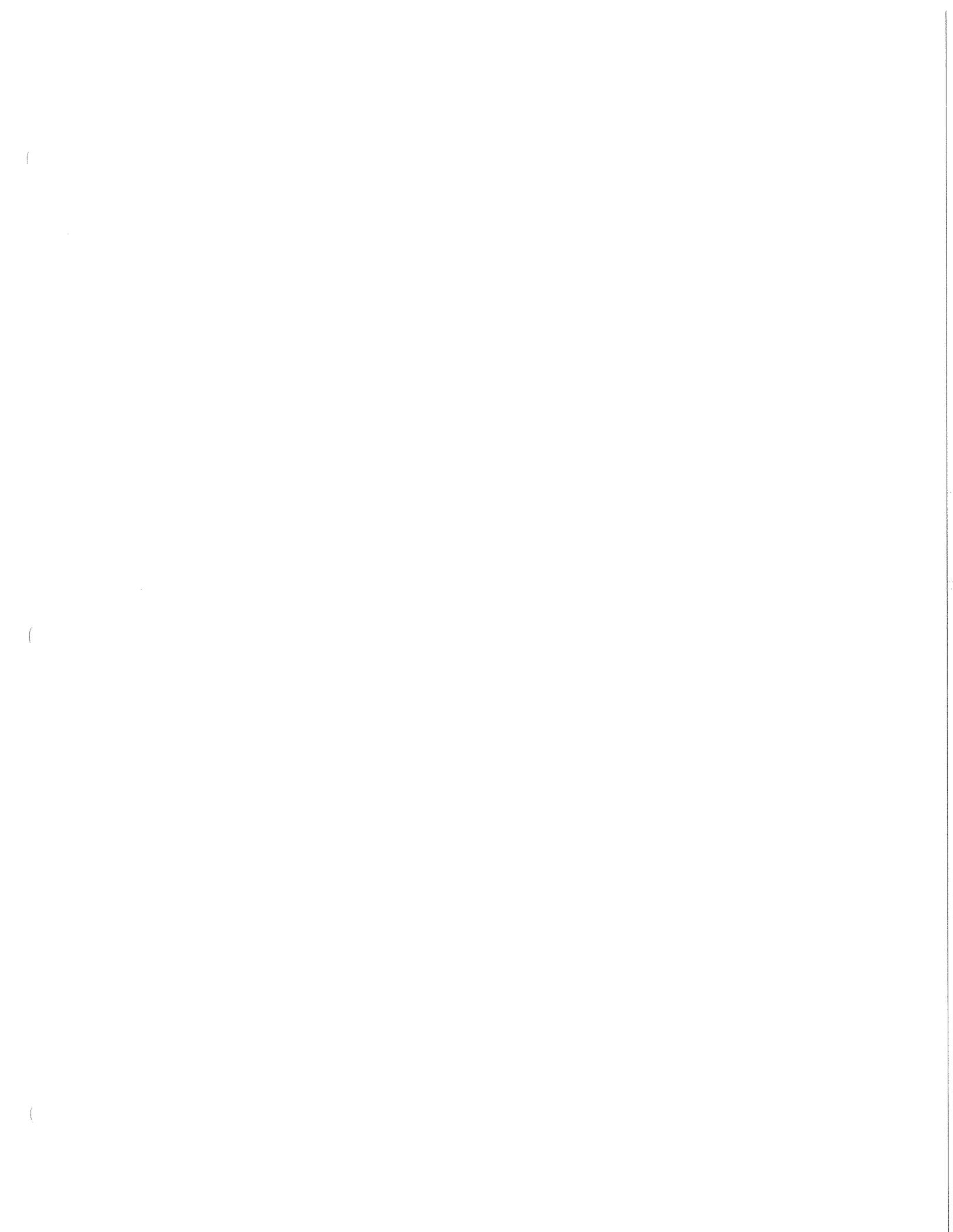
Mitigation Action: Armona CSD #1—Emergency Power Generator

Action:	Install emergency power generator at water Well No. 1
Jurisdiction:	Armona Community Services District
Priority:	High
Issue/Background:	Armona Community Services District (CSD) relies on local groundwater to provide for residential, commercial, industrial, and fire protection needs. Due to local topographical conditions, distribution system pressure must be maintained by booster pumps.
Ideas for Implementation:	<p>Due to site conditions at Well No. 1, additional property would need to be obtained to install an emergency generator and associated equipment at this site. A generator would need to be sized to meet the electrical needs of the facility, purchased, and installed.</p> <p>Currently, the Armona CSD water system operates two wells, Well No. 1 and Well No. 2. Facilities at Well No. 1 include treatment facilities designed to remove objectionable taste, color, and odor from the water; storage reservoir; and booster pumps. Facilities at Well No. 2 include storage reservoir, emergency generator, chlorination equipment, and booster pumps. The water produced from Well No. 2 does not meet all primary and secondary drinking water standards. The constituents of concern are arsenic, color, odor, and taste. The district attempts to limit the use of this well as much as possible. The district is in the process of obtaining funding and additional property adjacent to Well No. 2 to construct a water treatment facility to address the constituents of concern.</p> <p>While the Armona CSD endeavors to maintain all facilities and equipment to manufacturers' and industry standards, unforeseen equipment failures can and do happen. Additionally, scheduled maintenance can take either of the existing facilities out of service for several days at a time. To provide reliable water service to the community, an emergency generator is needed at Well No. 1.</p>
Responsible Office:	Armona Community Services District
Partners:	Undetermined at this time
Potential Funding:	Community Development Block Grants, state funding programs, Hazard Mitigation Grant Program 5 percent state initiatives
Cost Estimate:	Preliminary estimate at \$500,000
Benefits: (Losses Avoided)	Installation of an emergency generator at Well No. 1 would make the water system more reliable and better protect the health and safety of the community. This project could avoid potential losses due to catastrophic fires during power outages, health issues related to the lack of potable water, and economic losses to the local business community.
Timeline:	Fiscal Year 2008/2009
Completed by:	Jonathan B. Demsky, Granger Water Specialties, Superintendent of Operations

Annex F: Armona Community Services District

Mitigation Action: Armona CSD #2—Public Education/Utility Bill Stuffers

Action:	Provide educational materials about natural hazards and risks in Kings County to customers in utility bills.
Jurisdiction:	Armona Community Services District (CSD)
Priority:	Medium
Issue/Background:	The Armona CSD has the ability to include public information and education materials on identified natural hazards with utility bills. These materials could reach all utility customers of the district.
Ideas for Implementation:	Develop materials tailored to local conditions that could be used as bill stuffers on a periodic basis. Include information with the bills on a seasonal basis, i.e., extreme heat information during the summer.
Responsible Office:	Armona CSD
Partners:	Kings County Office of Emergency Services, Kings County Office of Administration
Potential Funding:	Hazard Mitigation Grant Program, Pre-Disaster Mitigation Program, other state programs, district revenues
Cost Estimate:	\$10,000
Benefits: (Losses Avoided)	Educate and inform local residents on actions they can implement to mitigate the effects of natural hazards.
Timeline:	Fiscal Year 2008/2009
Completed by:	Jonathan B. Demsky, Granger Water Specialties, Superintendent of Operations



ANNEX G: KINGS COUNTY SCHOOL DISTRICTS

Fourteen out of fifteen school districts in Kings County and the Kings County Office of Education participated in the hazard mitigation plan. The Office of Education coordinated participation from the school districts and provides the following services to the school districts:

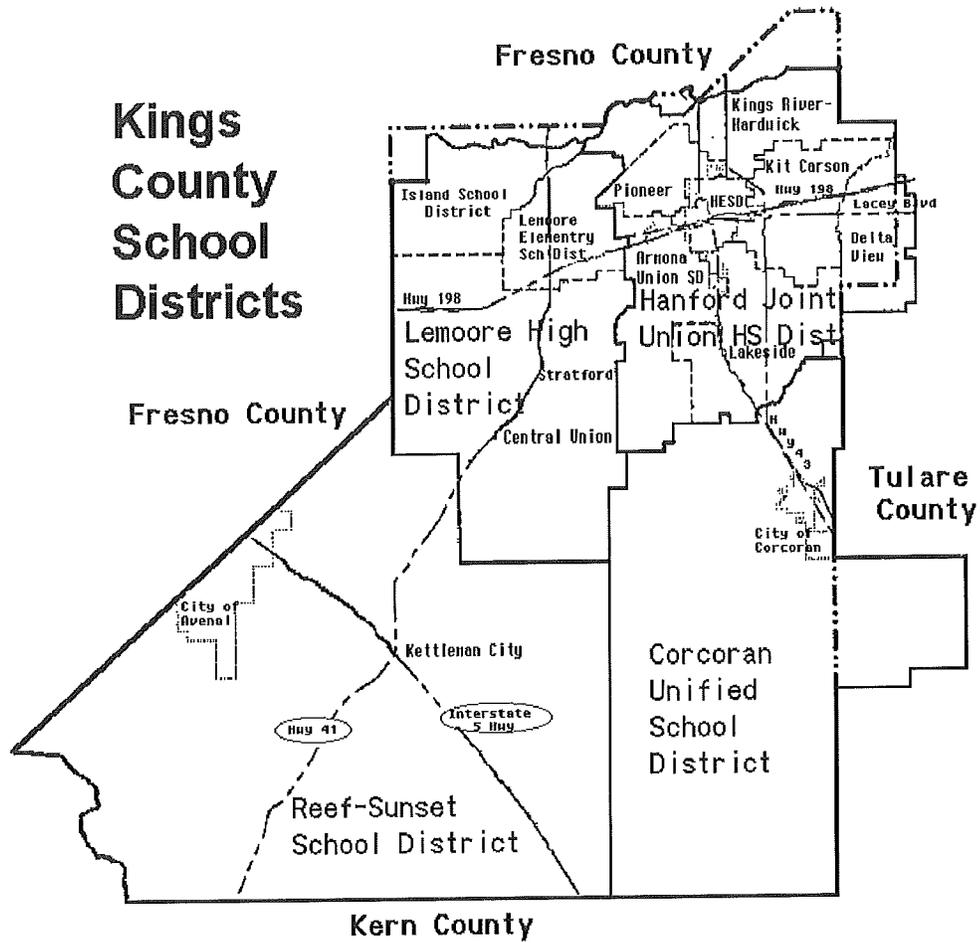
- Advises and assists school districts in managing their budgets and in saving taxpayer money
- Supervises and supports school districts in complying with state and federal laws
- Provides numerous services to school districts that they could not offer on their own
- Educates groups of students not served by local school districts through the Juvenile Court and Community Schools, Special Education Program, Cysis, and Infant Programs
- Assists teachers by providing training opportunities, curriculum development, and technology resources

Information on past hazard losses, existing safety plans and policies, and other mitigation projects for each school district is provided below. Hazard information for each school district is similar to that presented in Chapter 3: Risk Assessment, depending upon the district's location in the county. A map of the school districts can be found on the following page.

There are currently no specific funding sources for hazard mitigation in any of the school districts.

Annex G: Kings County School Districts

Figure G.1: Kings County School Districts



Source: Kings County Office of Education

Annex G: Kings County School Districts

ARMONA UNION ELEMENTARY SCHOOL DISTRICT

This school district includes Armona Elementary, Crossroads Charter, and Parkview Middle Schools in the town of Armona and serves approximately 1,467 students.

Past Hazard Events

No information.

Existing Plans and Programs

- Evacuation plans
- Tornado safety program/drills
- Earthquake safety program/drills
- Annual update of Safety Manual

Other Mitigation Projects

Anchored bookshelves.

CENTRAL UNION SCHOOL DISTRICT

Central Union School District is made up of four elementary schools (Akers, Central, R.J. Neutra, and Stratford). Two schools are located at the Lemoore Naval Air Station. There are approximately 1,800 students enrolled in all four schools. The Central Union School District has two federal facilities within its boundaries: The Santa Rosa Rancheria and the Lemoore Naval Air Station.

Past Hazard Events

No information.

Existing Plans and Programs

- Evacuation plans
- Shelter-in-place plans at Akers and R.J. Neutra
- Earthquake safety program/drills
- Flood safety program/drills
- Others: air crash; bomb threat; Lemoore Naval Air Station base closure; poor air quality program; school bus emergency; code black (evacuation/relocation); code red (life threatening); and code yellow (imminent threat)

Other Mitigation Projects

Anchored bookshelves.

Annex G: Kings County School Districts

CORCORAN UNIFIED SCHOOL DISTRICT

Corcoran Unified School District is made up of three elementary schools, one middle school, and one high school, Kings Lake Alternative School, and the Corcoran Academy. The total enrollment for the district in 2005 was 3,325 students.

Past Hazard Events

No information.

Existing Plans and Programs

None.

Other Mitigation Projects

None.

HANFORD ELEMENTARY SCHOOL DISTRICT

The Hanford Elementary School District includes nine elementary schools (Hamilton, Jefferson, Lee Richmond, Lincoln, Martin Luther King Jr., Monroe, Roosevelt, Simas, and Washington) and two junior high schools (John F. Kennedy and Woodrow Wilson) in the city of Hanford. Enrollment is approximately 5,515 students.

Past Hazard Events

Water damage to classrooms from bursting pipes caused by a freeze in January 1995; no assets at risk were found based on Interim Evaluation Instrument.

Existing Plans and Programs

- Evacuation plans
- Tornado safety program/drills
- Earthquake safety program/drills

Other Mitigation Projects

All buildings that house children meet California Division of State Architecture standards and approval.

HANFORD JOINT UNION HIGH SCHOOL DISTRICT

The Hanford Joint Union High School District includes Hanford High School, West Hanford High School, Earl F. Johnson High School, and the Hanford Adult School in the City of Hanford. Total enrollment in the district is 3,738 students.

Past Hazard Events

A severe lightning strike on April 28, 2005, damaged fire alarm system, clocks, bells, and the emergency medical system. Damage cost \$27,000.

Annex G: Kings County School Districts

Existing Plans and Programs

- Evacuation plans
- Earthquake safety program/drills
- Safe school plan

Other Mitigation Projects

None identified.

ISLAND UNION ELEMENTARY SCHOOL DISTRICT

Island Union School District is a charter district that includes Island Union Elementary School (kindergarten through eighth grade) in the city of Lemoore. Total enrollment in the district is 255 students.

Past Hazard Events

No information.

Existing Plans and Programs

- Evacuation plans
- School Safety Plan

Other Mitigation Projects

None identified.

KINGS COUNTY OFFICE OF EDUCATION

The Kings County Office of Education operates three schools for groups of students not served by local school districts. These include the Shelly Baird School severely disabled students from ages 3-22; the Kings Community School for students from seventh to twelfth grades who were expelled from their home districts; and the J.C. Montgomery/Boot Camp for juvenile offenders. The Kings County Probation Department maintains the facilities at this school.

Past Hazard Events

No information.

Existing Plans and Programs

- Evacuation plans
- Earthquake safety program/drills
- Safety plan is currently being rewritten

Other Mitigation Projects

Bookshelves and large furniture are anchored. New windows were installed at a school site.

KINGS RIVER-HARDWICK ELEMENTARY SCHOOL DISTRICT

The Kings River-Hardwick School District consists of Hanford's Kings River-Hardwick Elementary School (kindergarten through eighth grade). The district serves approximately 600 students with additional services to preschool age children.

Past Hazard Events

No information.

Existing Plans and Programs

- Evacuation plans
- Earthquake safety program/drills

Other Mitigation Projects

Book shelves and cabinetry anchored to walls for earthquake retrofitting.

KIT CARSON UNION ELEMENTARY SCHOOL DISTRICT

The Kit Carson Union School District in Hanford includes Kit Carson Elementary School and the Mid-Valley Alternative Charter School. Total enrollment in the district in 2005 was 425 students.

Past Hazard Events

No information.

Existing Plans and Programs

- Evacuation plans
- Earthquake safety program/drills
- Emergency plan is reviewed with all employees

Other Mitigation Projects

The district installed two sump pumps. One at end of parking lot and one by classrooms to avoid flooding.

LAKESIDE UNION ELEMENTARY SCHOOL DISTRICT

Lakeside Union School District in Hanford has two schools: Gardenside Elementary (kindergarten through third grade) and Lakeside School (fourth through eighth grades). Total enrollment in the district in 2005 was 432 students.

Past Hazard Events

No information.

Existing Plans and Programs

- Evacuation plans

Annex G: Kings County School Districts

- Shelter-in-place plans
- Tornado safety program/drills
- Earthquake safety program/drills

Other Mitigation Projects

Library shelving is anchored to walls. Classroom bookshelves are built in. No items are allowed on tops of bookshelves.

LEMOORE UNION ELEMENTARY SCHOOL DISTRICT

The Lemoore Union School District includes four elementary schools (Cinnamon, Engvall, Lemoore, and Meadow Lane), Liberty Middle School, and the University Charter School. Total enrollment in the district in 2005 was 3,200 students.

Past Hazard Events

Freezing weather that occurred January 16-19, 2007, burst water pipes and boiler pipes and caused Liberty Middle School to close January 18-19, 2007.

Existing Plans and Programs

- Evacuation plans
- Earthquake safety program/drills
- Fire drills
- Intruder drills

Other Mitigation Projects

Anchored bookshelves.

LEMOORE UNION HIGH SCHOOL DISTRICT

The Lemoore Union High School District includes Lemoore High School and Gertrude F. Gundacker Alternative Education Facilities, Donald C. Jamison High School, Middle College High School, and Yokuts High School. The service area of the district extends into Naval Air Station Lemoore and the Santa Rosa Rancheria. Total enrollment in the district in 2005 was 2,141 students.

Past Hazard Events

None

Existing Plans and Programs

- Evacuation plans
- Earthquake safety program/drills
- Comprehensive safety plan

Annex G: Kings County School Districts

Other Mitigation Projects

All school construction and modernization projects comply with California Division of State Architecture structural requirements.

PIONEER UNION ELEMENTARY SCHOOL DISTRICT

The Pioneer Union Elementary School District includes Pioneer Elementary School, Frontier Elementary School, and Pioneer Middle School in Hanford. Total enrollment in the district in 2005 was 1,383 students.

Past Hazard Events

No information.

Existing Plans and Programs

- Evacuation plans
- Shelter-in-place plans
- Earthquake safety program/drills
- Others: bullying prevention; character counts; stranger on campus; traffic/bike safety

Other Mitigation Projects

All classrooms have anchored bookshelves. Safe school plans are in place for both schools and the district.

REEF-SUNSET UNIFIED SCHOOL DISTRICT

Reef-Sunset Unified School District includes four elementary schools (Avenal, Tamarack, Kettleman City, and Reef-Sunset Primary Day), one middle school (Reef-Sunset Middle School), three high schools (Adelanta Continuation High, Avenal High, and Sunset High), Reef-Sunset Secondary Day School, and adult education in the city of Avenal and Kettleman City. Total enrollment in the district in 2005 was 2,584 students.

Past Hazard Events

Freezing weather events occur regularly.

Existing Plans and Programs

- Evacuation plans
- Shelter-in-place plans
- Earthquake safety program/drills

Other Mitigation Projects

Buildings are inspected after earthquakes and freezes for structural soundness. All bookshelves are secured.

Annex G: Kings County School Districts

Table G.1: Existing Capabilities of School Districts

School District	Evacuation Plans	Shelter-in-Place Plans	Tornado Program/Drills	Earthquake Program/Drills	Flood Safety Program/Drills	Other Plans
Armona Union	✓		✓	✓		Annual update of safety manual
Central Union	✓	✓		✓	✓	Several, see district section
Corcoran Unified						
Hanford Elementary	✓		✓	✓		
Hanford Joint Union High School	✓			✓		Safe School Plan
Island Union Elementary	✓					School Safety Plan
Kings River-Hardwick	✓			✓		
Kit Carson	✓			✓		Emergency plan reviewed with all employees
Kings County Office of Education	✓			✓		Safety plan currently being updated
Lakeside	✓	✓	✓	✓		
Lemoore Elementary	✓			✓		Fire drills, intruder drills
Lemoore High School	✓			✓		Comprehensive safety plan
Pioneer	✓	✓		✓		Bullying prevention, character counts, stranger on campus, traffic/bike safety
Reef-Sunset	✓	✓		✓		Yes, but unspecified
Percentage with Capability	100%	29%	21%	86%	7%	

Annex G: Kings County School Districts

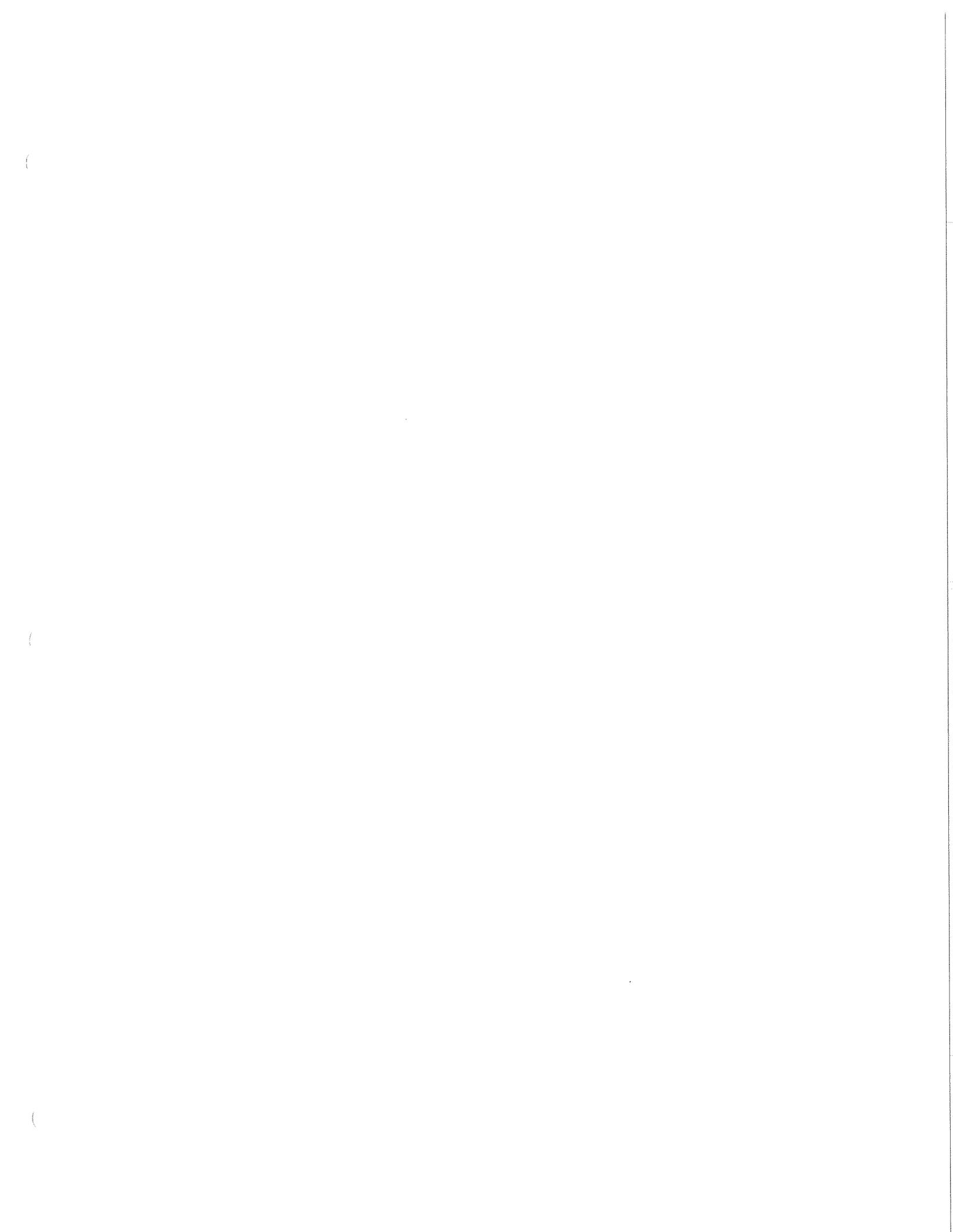
Mitigation Action: Kings County School Districts #1—Plans for Special Needs Students

Action:	Implement a program for supporting medically fragile and special needs students at each school site during emergency events.
Jurisdiction:	14 Participating School Districts
Priority:	High
Issue/Background:	In reviewing emergency operation plans and developing the hazard mitigation plan, we have determined that we are lacking a plan to assist and sustain medically fragile and special needs students during an emergency situation. Many of these students currently have medical orders for providing on file with the school site, but do not have medical orders or long term health plans for a period extending beyond the school day.
Ideas for Implementation:	Kings County Office of Education and Kings County School District Nurses would develop a request for extended care orders from medical providers of medically fragile and special needs students. The nurses would develop a cover letter and a form for the physician's to complete. Parents would receive a copy of the form once it was completed by the physician. Parents would be responsible for providing medical supplies as designated by the physician.
Responsible Office:	Superintendent's Office of each School District
Partners:	Kings County Office of Education, medical providers, parents of students with special needs, Kings County Health Department
Potential Funding:	In-kind from partners
Cost Estimate:	Donated time for development of forms. Current staff time to provide information requests to medical providers and parents.
Benefits: (Losses Avoided)	Reduced risk to students' health and safety during emergency events. Protection against liability claims against school districts, health officials, and emergency responders.
Timeline:	Spring 2007, school district nurses will begin meeting with the Kings County Office of Education. Fall 2007, discussion with medical providers and develop extended care order form. Spring 2008, begin implementation and modify as necessary. By fall 2008, have routine procedure to secure extended care orders for special needs students.
Completed by:	Tamara Ravalin, Kings County Office of Education, Assistant Superintendent

Annex G: Kings County School Districts

Mitigation Action: Kings County School Districts #2—Earthquake Hazards at Schools

Action:	Implement a plan for training school maintenance crews to identify and address nonstructural hazards in schools to mitigate earthquake risk.
Jurisdiction:	14 Participating School Districts
Priority:	High
Issue/Background:	Although school districts conduct earthquake drills with students on a routine basis and follow codes to assure facilities are in proper compliance, many classrooms, offices, and other facilities still have bookcases and other objects which would not be stable during an earthquake.
Ideas for Implementation:	<p>Kings County Office of Education and Kings County Self-Insured Schools would develop a facility hazards check-off list and train maintenance staff in the identification of nonstructural hazards. In addition, maintenance crews would be trained on how to address and mitigate these hazards.</p> <p>Training would be conducted by the Director of Kings County Self-Insured Schools (KCSIS) in conjunction with Schools Insured Schools of California (SISC) and provided to maintenance and operations directors and chief business officials of Kings County School Districts. Maintenance crews would carry out program.</p>
Responsible Office:	Maintenance and Operations Directors of each school district
Partners:	Kings County Office of Education, KCSIS, SISC
Potential Funding:	In-kind from partners
Cost Estimate:	Donated time for development of forms, training, and recordkeeping by partner agencies
Benefits: (Losses Avoided)	Reduced risk to students, staff, and school property during future seismic events. Protection against liability claims and workers compensation claims against school districts and emergency responders.
Timeline:	Summer 2007, KCSIS, SISC, and the Kings County Office of Education will develop training materials. Fall 2007, maintenance directors and chief business officials will attend training in conjunction with regularly scheduled trainings. Spring 2008, begin implementation and modify as necessary. By fall 2008, have routine procedure to identify and address nonstructural hazards in schools to mitigate earthquake risk.
Completed by:	Tamara Ravalín, Kings County Office of Education, Assistant Superintendent



ANNEX H: TULARE LAKEBED RECLAMATION DISTRICTS

DISTRICT PROFILE

The material presented in this annex applies to the following Tulare Lakebed Reclamation Districts, which are coordinated and represented by the JG Boswell company:

1. Delta Lands Reclamation District No. 770 – 26,800 acres
2. El Rico Reclamation District No. 1618 - 13,500 acres
3. Lovelace Reclamation District No. 739 – 6,000 acres
4. North Central Consolidated Reclamation District No. 2071 - 7,100 acres
5. South Central Reclamation District No. 2125 - 10,200 acres
6. Tulare Lake Reclamation District No. 749 – 26,400 acres

HAZARD IDENTIFICATION AND PROFILES

Representatives from the Tulare Lakebed Reclamation Districts identified hazards that affect the districts based upon the countywide risk assessment and past events and their impacts.

Table H.1: Tulare Lakebed Reclamation Districts—Hazard Profiles

Hazard	Significance and Impacts
Dam Failure	High, but low probability
Drought	Low
Earthquake	Low, though could potentially damage districts' levees
Extreme Heat	Low
Flood	High
Fog	Low
Freeze	Low
Landslide	Low
Soil Hazards: Expansive, Liquefaction, Erosion	Low, though could potentially damage districts' levees
Tornado	Low
Wildfire	Low

The Tulare Lake Basin has a long history of flooding and on average a significant flood event occurs every four to five years. The reclamation districts have summarized the three most recent significant flood events.

Annex H: Tulare Lakebed Reclamation Districts

Spring 2006: A very wet year and high runoff from the Sierra watersheds created potential for flooding in the lakebed. The districts avoided flooding, despite such a wet year, by diverting 115,000 acre-feet of water away from the productive agricultural lands and improvements within the districts through diversion programs, including the pumping of 82,000 acre-feet into storage facilities in the lakebed. The districts spent \$1.6 million on these flood-avoidance measures; however, these measures cost much less than the flood damages of previous events, such as the two described below.

Winter/Spring 1998: A very wet El Nino year with high runoff from the Sierra watersheds resulted in 32,000 acres flooded with 163,000 acre-feet of water. Another 336,000 acre-feet was diverted from the lakebed through programs of the districts and 118,000 acre-feet was stored in lakebed basins. Significant damage to levees occurred. The resulting damages and cost of the flood event was \$7.3 million.

Winter 1997: Very intense La Nina storms in January 1997 flooded 44,000 acres with 258,000 acre-feet of water causing significant damage to levees. Another 90,000 acre-feet of water was diverted from the lakebed through programs of the districts and 113,000 acre-feet was stored in lakebed basins. The total damages and cost of the event was \$10.8 million.

VULNERABILITY ASSESSMENT

The facilities of the Tulare Lakebed Reclamation Districts include levees, which provide flood protection, and pumping stations, which provide seepage control and dewatering. All of these assets are located in an area that can be threatened with flooding in wet years. The table that follows lists the critical facilities and other assets of the reclamation districts.

Table H.2: Tulare Lakebed Reclamation Districts—Critical Facilities and other Assets

Facility	Replacement Value
RD 770 Levees (13 miles)	\$10,000,000
RD 749 Levees (21 miles)	\$16,000,000
RD 739 Levees (10 miles)	\$8,000,000
RD 2071 Levees (8 miles)	\$6,000,000
RD 2125 Levees (10 miles)	\$8,000,000
RD 1618 Levees (21 miles)	\$16,000,000
RD 770 flood water diversion pump station	\$200,000
RD 770 seepage pump stations (4)	\$300,000
RD 749 seepage pump stations (4)	\$300,000
RD 739 seepage pump stations (2)	\$150,000
RD 2071 seepage pump stations (2)	\$150,000
RD 2125 seepage pump stations (2)	\$150,000
RD 1618 pump station	

Development Trends

There are not any planned new developments or improvements at this time.

CAPABILITY ASSESSMENT

The reclamation districts consistently maintain levees and other improvements to a standard intended to ensure that the levees provide a high level of protection to lands in the districts. The districts recently developed a draft emergency operations plan that is currently under review by the California Office of Emergency Services. This plan describes the actions, including coordination responsibilities and off-site diversion programs, which district representatives should take in a flood fight.

Landowners in the districts typically provide support services for the districts. These services include engineering, construction management, operation and maintenance, accounting, and financial support. Landowners also can provide GIS support and other technical services. As necessary, the districts hire consultants and outside contractors for specific services, such as grant writing.

Table H.3: Tulare Lakebed Reclamation Districts—Personnel Capabilities

Personnel Resources	Department/Position	Comments
Engineer/professional trained in construction practices related to levees and/or infrastructure	Design/construction engineers	Landowners provide technical support
Planner/engineer/scientist with an understanding of natural hazards	Hydrologists	Landowners provide technical support
Personnel skilled in GIS	GIS specialist	Landowner support
Emergency manager	Operations manager	Landowner support
Grant writer		Consultant
Other personnel	Accountants	Landowner support

Projects to reduce the threat of flood damage to land and improvements in the districts typically are funded through landowner assessments levied by the boards of trustees of the districts. There are currently no specific funding sources for hazard mitigation. The table on the following page shows the current fiscal capabilities of the reclamation districts.

Annex H: Tulare Lakebed Reclamation Districts

Table H.4: Tulare Lakebed Reclamation Districts—Fiscal Capabilities

Financial Resources	Accessible/ Eligible to Use	Comments
Community Development Block Grants	No	
Capital improvements project funding	Yes	Landowners can be assessed for projects approved by the boards of trustees of the districts
Authority to levy taxes for specific purposes	Yes	As approved by landowners
Fees for water, sewer, gas, or electric services	N/A	
Incur debt through general obligation bonds	Yes	Feasible, but no history
Incur debt through special tax bonds	N/A	
Incur debt through private activities	Yes	Feasible
Other		Landowner voluntary assessments

The reclamation districts operate several ongoing flood mitigation projects and programs, such as the following:

- Maintaining existing levees that provide flood protection to land and improvements in the districts
- Participating in lakebed floodwater storage operations that reduce flood threat to the districts
- Operating offsite floodwater diversion programs that reduce flood threat to the districts
- Participating in projects that increase the capacity of local flood control reservoirs owned and operated by the U.S. Army Corps of Engineers

GOALS AND OBJECTIVES

The districts participated in developing the goals and objectives for the overall plan. In addition, the districts have the following specific goals:

- Reduce the threat of flood damage to land and improvements in the districts with improved levee and expanded diversion programs
- Maintain eligibility for federal and state disaster recovery and hazard mitigation funding

MITIGATION ACTIONS

The Tulare Lakebed Reclamation Districts identified and prioritized the following mitigation actions based on the risk assessment. Background information, as well as information on how the action will be implemented and administered, such as ideas for implementation, responsible office, partners, potential funding, estimated cost, and timeline, also are described.

Annex H: Tulare Lakebed Reclamation Districts

Mitigation Action: Tulare Lakebed Reclamation Districts #1—Levee Improvements

Action:	Raise levee to improve protection of agricultural lands and property from flood hazards.
Jurisdiction:	Delta Lands Reclamation District No. 770
Priority:	Medium
Issue/Background:	Levees owned and operated by reclamation districts in the Tulare Lake basin protect productive agricultural lands and improvements from flooding. The level of protection provided by these levees can be increased by raising them.
Ideas for Implementation:	Raising this levee will involve moving significant volumes of earthen material. This would be performed with heavy equipment scrapping material from adjacent borrow areas and placing in on the levees. As the material is placed, it would be watered and compacted. An increase of two feet in the height of the levee is proposed.
Responsible Office:	Delta Lands Reclamation District No. 770
Partners:	
Potential Funding:	Self-funded by the district through landowner assessments.
Cost Estimate:	\$2,800,000
Benefits: (Losses Avoided)	Raising the levee provides a higher level of protection to lands and improvements within the district. A higher levee also provides an additional increment of flexibility in the management of floodwaters.
Timeline:	Proposed within the next five years – through 2012.
Completed by:	Walter Bricker, Tulare Lakebed Reclamation Districts, District Trustee

Annex H: Tulare Lakebed Reclamation Districts

Mitigation Action: Tulare Lakebed Reclamation Districts #2—Electric Service to Pump Station

Action:	Convert pump station to electric power to improve reliability of flood protection.
Jurisdiction:	Delta Lands Reclamation District No. 770
Priority:	Medium
Issue/Background:	Delta Lands Reclamation District intercepts damaging flood water upstream of the Tulare Lakebed and diverts it into the Friant-Kern Canal. The flood water in the canal is delivered to water users that can put it to beneficial use. Pumps operated by Delta Lands are used to divert the flood water into the canal. Historically, these pumps have been powered by diesel engines, which are subject to frequent interruptions in service due to mechanical problems and overheating in a small confined area. Because electrical service would be a more reliable power source, the district is proposing to convert these pumps from diesel power to electric power.
Ideas for Implementation:	Electric service would have to be extended by the local utility company a limited distance. The district would have to purchase and install the equipment necessary to accept the service and deliver power to the pumps. The district would also have to acquire electric motor and related equipment to run the pumps.
Responsible Office:	Delta Lands Reclamation District No. 770
Partners:	
Potential Funding:	Self-funded by the district through landowner assessments
Cost Estimate:	\$400,000
Benefits: (Losses Avoided)	Conversion of the pumps to electrical power will provide a more reliable and cleaner operation. This reliability results in a higher level of protection to lands and improvements within the district.
Timeline:	Proposed within the next three years – through 2012.
Completed by:	Walter Bricker, Tulare Lakebed Reclamation Districts, District Trustee

APPENDIX A: REFERENCES

- California Department of Water Resources. 2006. "Drought Preparedness."
<http://watersupplyconditions.water.ca.gov/background.cfm>.
- California Governor's Office of Emergency Services. "Origins and Development: A Chronology, 1917-1999." www.oes.ca.gov/.
- City of Hanford. 2002. City of Hanford General Plan Update Final Environmental Impact Report.
- Cole, L and R Hansen. 2005. *The Birds of Kings County*. Transmitted to AMEC via the Internet (<http://fog.ccsf.cc.ca.us/~jmorlan/kingbirding.htm>). January 3, 2007.
- Cutter, Susan L, Bryan Boruff, and W. Lynn Shirley. 2003. "Social Vulnerability Environmental Hazards." *Social Science Quarterly* Volume 84 Number 2, June 2003.
- Ekstrom, Goran and et al. 1992. "Seismicity and geometry of a 110-km-Long Blind Thrust Fault. The 1985 Kettleman Hills, California, Earthquake." *Journal of Geophysical Research* (97) B4: 4843-4864.
- Federal Emergency Management Agency. 2007. "Region IX Disaster History."
www.fema.gov/regions/ix/disasters_region9.fema#CA.
- Federal Emergency Management Agency 386-2: "Understanding Your Risks – Identifying Hazards and Estimating Losses." 2002. State and Local Mitigation Planning How-to-Guide.
- Federal Emergency Management Agency: "Developing a Mitigation Plan." 2002. State and Local Mitigation Planning How-to-Guide.
- Hoover, MB and et al. 2002. *Historic Spots in California*, Fifth Edition. Stanford University Press.
- Kings County. 2005. Agricultural Crop Report.
- Kings County. 2002. Kings County Emergency Operations Plan.
- Kings County. 1994. Kings County General Plan.
- Kings County Economic Development Corporation. 2006. Kings County Facts.
www.kingsedc.org/countyfacts.html.
- Kings County. 1993. Biological Resources Survey, Resource Conservation Element Update, Kings County General Plan. Prepared by Hansen's Biological Consulting.
- Kings Rivers Conservation District. 2007. www.krccd.org/.

National Drought Mitigation Center, University of Nebraska-Lincoln. 2006.
<http://drought.unl.edu/>.

National Oceanic and Atmospheric Administration National Climatic Data Center. 2006.
www.ncdc.noaa.gov/oa/ncdc.html.

National Oceanic and Atmospheric Administration Storm Prediction Center. 2006. "The online tornado FAQ." www.spc.noaa.gov/faq/tornado

Paulson, RW, Chase, EB, Roberts, RS, and Moody, DW, Compilers. "National Water Summary 1988-89 - Hydrologic Events and Floods and Droughts." *U.S. Geological Survey Water-Supply Paper 2375*. http://geochange.er.usgs.gov/sw/impacts/hydrology/state_fd/cawater1.html.

San Diego District Attorney. 1992. "Waste Management, Inc. Final Report."

Special Publication for Association of California Water Agencies and Colorado River Water Users Association Conferences. 2005. *Colorado River Basin Climate*.

Southern California Earthquake Data Center. 2006. Fort Tejon Earthquake.
www.data.scec.org/chrono_index/forttejo.html.

State of California. 2005. California Water Plan. www.waterplan.water.ca.gov/.

State of California. 2004. California State Multi-Hazard Mitigation Plan.

University of South Carolina Hazards and Vulnerability Research Institute. Social Vulnerability Index for the United States 2000. www.cas.sc.edu/geog/hrl/sovi.html.

University of South Carolina Hazards Research Lab. 2006. SHELDUS Database (Spatial Hazard Events and Losses Database for the United States).
http://go2.cla.sc.edu/sheldus/db_registration.

U.S. Department of Agriculture. 1991. "Drought hurts local economies - counties in California." *Agricultural Outlook* Economic Research Service Report. July, 1991.
www.findarticles.com/p/articles/mi_m3778/is_1991_July/ai_12034695/pg_1.

U.S. Geological Survey. 2004. *Summary of Floods and Droughts in the Southwestern States*.

U.S. Geological Survey. 2001. "Landslide Overview Map of the Conterminous United States." Geological Survey Professional Paper 1183. <http://pubs.usgs.gov/pp/p1183/pp1183.html>.

U.S. Geological Survey. 1997. "When Could the Next Large Earthquake Occur Along the San Andreas Fault?" <http://pubs.usgs.gov/gip/earthq3/when.html>.

Western Regional Climate Center. 2007. www.wrcc.dri.edu/CLIMATEDATA.html.

APPENDIX B: DOCUMENTATION OF PLANNING PROCESS AND PARTICIPATION

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1. Hazard Mitigation Planning Committee members
 2. Letter of Invitation to Kickoff Meeting
 3. Invite List to Kickoff Meeting
 4. Agenda for Kickoff Meeting
 5. Sign-in Sheet for Kickoff Meeting
 6. Agenda for HMPC Meeting #2
 7. Sign-in Sheet for HMPC Meeting #2
 8. Agenda for HMPC Meeting #3
 9. Sign-in Sheet for HMPC Meeting #3
 10. Public Notice for Corcoran Public Meeting
 11. Sign-In Sheet for Corcoran Public Meeting
 12. Flyer for Kings County Public Meeting
 13. Sign-In Sheet for Kings County Public Meeting
 14. Public Meeting Questionnaire
 15. Letter of Invitation to Comment on Plan Draft
 16. Public Notice of Availability of Plan Draft for Comment
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Kings County Hazard Mitigation Planning Committee

Organization	Representative
Kings County Fire Department	Jim Kilner
Kings County Office of Emergency Services	Trudy Maletta, Chair
Kings County Board of Supervisors	Joe Neves
Kings County Department of Public Health	Sabrina Bustamante/Jennifer Denton
Kings County Planning/GIS	Greg Gatzka/Kara Bounds
Kings County Administration	Thomas Smith
Kings County Agricultural Commissioner	Les Wright
Kings County Office of Education (school districts)	Tamara Ravalin
City of Corcoran (Police Department)	Randy Leach/ Reuben Shortnacy/Gary Cramer
City of Hanford (Fire Department)	Tim Ieronimo/Bill Lynch
City of Lemoore (Police Department)	Wes Roberts
City of Avenal (City Manager)	Melissa Whitten/Rob Williams
Tachi Yokut Tribe	Terry Simmons
Armona Community Services District	Jon Demsky
Tulare Lake Reclamation Districts	Walter Bricker/Debbie Bello
Kings River Conservation District	Keith Seligman/Richard Hoelzel
Cross Creek Flood Control District	Doug Davis
California Office of Emergency Services	Paul Calkins



Kings County Office of Emergency Services

Kings County Fire Department
280 N. Campus Drive ❖ Hanford, California 93230
☎ (559) 582-3211 extension 2881 FAX (559) 582-8261
Joe Neves, Board of Supervisors, Emergency Services Director

«AddressBlock»

Re: Emergency Operations and Hazard Mitigation Planning Projects

«GreetingLine»

The Kings County Operational Area has received grant funds to support two important emergency management planning projects. The first will meet the need to review and update the County's Operational Area Emergency Operations Plan, support the preparation of individual response plans for the Cities of Hanford, Lemoore, Corcoran, and Avenal and the Tachi Yokut Tribe. These response plans will meet all current state and federal requirements, including those governing California's Standardized Emergency Management System (SEMS) and the Federal Government's National Incident Management System (NIMS).

In addition to the response planning, the project includes planning, facilitating, and evaluating five tabletop training exercises for the cities and tribal participants. These will be followed by a later countywide tabletop exercise. The six exercises will provide additional learning opportunities before the plans are presented for adoption by the cities' councils, the tribal council, and the Board of Supervisors.

The second project will result in the preparation of a Federally required countywide Multi-Hazard Mitigation Plan. The Disaster Mitigation Act of 2000 requires all local governments to address risks of and measures that can be taken in advance to reduce future losses from natural and other closely related hazards. A Hazard Mitigation Planning Committee (HMPC) will be formed to support this project and, in addition to the communities and the tribe, the HMPC will include representatives of special districts and other county, state, and federal agencies in or that serve Kings County.

The approved mitigation plan will assure that Kings County maintains its eligibility for Federal Pre-Disaster Mitigation (PDM) and Post-Disaster Hazard Mitigation Grant Programs (HMGP), Flood Management Assistance (FMA) grants, and related U.S. Army Corps of Engineers' requirements governing flood mitigation projects. The approved plan also may help reduce flood insurance premiums currently paid by County residents and encourage greater participation in the National Flood Insurance Program (NFIP) by those exposed to this risk.

The County has retained Robert Olson Associates (ROA) of Folsom, California to manage the requirements and processes involved in completing these two important projects. The firm has

Emergency Operations and Hazard Mitigation Planning Projects

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Page 2

extensive experience in all aspects of these programs. Mr. Olson provided an overview of the projects and processes involved on August 8 at our offices. ROA has assembled a team of long-time colleagues to work with us and who are experienced emergency management and hazard mitigation specialists.

ROA will facilitate the planning, collect the necessary data, and perform other technical services, including preparing the risk analyses and planning documents. However, the Department and ROA will need our help to successfully complete these projects. **At your earliest convenience, I ask that you designate one person to be ROA's principal point of contact.** This does not mean that he or she will be expected to attend every meeting or be your only participant. Rather, this person will help ROA identify other people who could have important information, technical knowledge, and valuable experience that could contribute to both of these planning projects.

Please send this information to:

Trudy Maletta, Emergency Services Coordinator at the address or fax number above or by e-mail: tmaletta@co.kings.ca.us

Thank you again for your early attention and response. I look forward to your support during the coming months as we greatly increase the County's abilities to respond to and recover from emergencies, and take steps to reduce future losses from the risks we face.

Sincerely,

Trudy Maletta
Emergency Services Coordinator

List of Invitees

Kings County Hazard Mitigation Plan Kickoff Meeting

City of Lemoore Police Department	Kings County Fire Department
City of Corcoran Police Department	Kings County Public Works Department
City of Hanford Fire Department	Kings County Sheriff's Office
City of Avenal City Manager	Kings County Environmental Health Services
U.S. Naval Air Station, Lemoore	Kings County Administration
College of the Sequoias	Kings County Agricultural Commissioner
West Hills College	Kings County Board of Supervisors
Hanford Elementary	Kings County Planning Department
Lemoore Union School District	Kings County Health Department
Kingsburg High School District	Kings County Office of Education
Hanford Joint Union High School District	Island Union School District
Lemoore Joint Union High School District	Riverdale Union School District
Delta View Joint Union School District	Reef Sunset Union School District
Pioneer Union School District	Laton Unified School District
Central Union School District	Corcoran Unified School District
King River Hardwick Union School District	Riverdale Joint Union High School District
Consolidated Irrigation District	Armona Union School District
Melga Water District	Lakeside Irrigation Water District
Dudley Ridge Water District	Kings County Water District
Salyer Water District	Angiola Water District
Devils Den Water District	Westlands Water District
Tulare Lake Drainage District	Deer Creek Storm Water Storage District
Homeland RCD #780	Cross Creek Flood Control District
Island RCD #776	South Central RCD #2125
Consolidated RCD #812	Tulare Lake RCD #749
Wilbur RCD #825	El Rico RCD #1618
Tulare Lake Reclamation District #761	Delta Lands RCD #770
Home Garden Community Services District	Armona Community Services District
Stratford Public Utilities District	Kettleman City Community Services District
Hanford Cemetery District	Corcoran Cemetery District
Kings County Mosquito Abatement District	Lemoore Cemetery District
Kaweah-Delta Water Conservation District	Excelsior District-Kings River Conservation District
Corcoran Irrigation District	Tulare Lake Resource Conservation District
Stratford Irrigation District	Kings River Conservation District
Alta Irrigation District	Empire-Westside Irrigation District
Corcoran District Hospital	Laguna Irrigation District

Agenda

Kings County Multi-Hazard Mitigation Plan Kickoff Meeting

**October 27, 2006, 8:30-11:30 AM
Kings County Government Center
1400 West Lacey Boulevard, Hanford, CA 93230**

1. Opening Remarks
2. Introductions
3. Mitigation, Disaster Mitigation Act Requirements, and the Planning Process
4. Multi-Jurisdictional Participation and the Hazard Mitigation Planning Committee (HMPC)
5. Planning for Public Involvement
6. Coordinating with other Agencies and Departments
7. Hazard Identification and Data Collection Needs

Sign-In Sheet
 Kings County Multi-Hazard Mitigation Plan
 Kickoff Meeting
 October 27, 2006

Name	Jurisdiction/ Department	Address	Phone	E-Mail
✓ Angela Spivertine	King's County Sheriff's Office	1144 W. Levey	589-7059	aspi@sheriff.kingcounty.wa.gov
✓ Rob Williams	CITY OF ALBANY	919 SKYLINE BLVD.	388-5766	RWilliams@cityofalbanyny.gov
✓ Wes Roberts	CITY OF LEWISBURG	657 FOX ST. LEWISBURG	924-9574	WRoberts@CityofLewisburg.com
✓ Randall W. Leach	Corcoran	1031 Chittenden Ave	992-5151	rleach@co.kings.ca.us
○ Thomas Smith	County of Kings	1400 W. Levey	582-3211 X318	Tsmith@co.kings.ca.us
○ J. D. Emsky	Vermona CSD		240 0301	jdems@vermonacsd.com
○ Terry Simmons	Taki Palace	17225 WERRY AVE	984-5711	tsimmons@takilpalace.com
✓ Phillip Estes	NOT A MEMBER	1115 5th Avenue	583-5000	pestes@kings.klcc.ca.us
✓ Tamara Franklin	Kings Co. Member	1144 W. Levey Blvd	589-2501	trfranklin@kings.klcc.ca.us
○ Stella Bogan	ARMONA School	P.O. Box 368 Armona	583-5000	SBogan@Kings.klcc.ca.us
○ Rick Hoerner	KING'S RIVER CONSULTATION DIST.	4886 E. Jensen	237-5567	rhoerner@kings.klcc.ca.us
Liz Simas	Newford Elementary	P.O. Box 1067	585-3164	lsvivas@lead.klcc.ca.us
Berry Mulligan	" "	" "	585-3628	bmulligan@hess.klcc.ca.us
Michelle Spencer	WEST WARD WASH	PO Box 6056	884-2523	michelle.spencer@westward.wa.gov
✓ Vince St. Montoya	King's County Health WEST HILLS College Levee	330 Campus Dr. 555 College Dr	584-1401 925 3080	VStMontoya@westhillscollege.wa.gov

Sign-In Sheet
 Kings County Multi-Hazard Mitigation Plan
 Kickoff Meeting
 October 27, 2006

Name	Jurisdiction/ Department	Address	Phone	E-Mail
GREG HENRY	PUESD	8810 14TH AVE	581-0112	henryg@presd.kcra.us
Keith Seligman	KRCO	4886 E. Jensen Fresno	217-4285	kseligman@krcd.org
Les Wright	Kings Co. Ag. Dept	630 N. Campus Dr Ste B Ag Skyline Bldg. 93112	582-3211	wright@co.kings.ca.us
William Whitson	City of Ukiah	919 Skyline Bldg. 93112	586 5764	whitson@cityofukiah.org
Wendell Brickner	Regional LAWRENCE REC. DISTRICTS	80. Box 577 Colusa, CA	992-5611	wbrickner@colusa.ca.us
Sabrina Bustamante	Kings Co. Public Health	330 Campus Dr.	584-1401	sbustama@co.kings.ca.us
Heiko Sweeney	Central Union Schol	15743 18th Ave Colusa	992-5707 ext 14	hsweeney@central.kra.ca.us
NATHAN STEE SR	THRE - Ukiah	17225 SERGET AVE	(581) 925-8835	nstee@cityofukiah.com
Bob Geyer	Ukiah - Ukiah	17225 SERGET AVE	589-925-2835	BGeyer@cityofukiah.com
Joe Neves	KCBOB	1400 Mary Blvd.	589-582-3211 2368	joen@stc.net
Tim Teronimo	Hanford Fire	350 W. Grangeville Blvd.	589-588-2545	teronimo@ci.hanford.ca.us

Agenda

Kings County Multi-Hazard Mitigation Plan Hazard Mitigation Planning Committee Meeting #2

**February 22, 2007, 9:00 am - 12:30 pm
Kings County Government Center
1400 West Lacey Boulevard, Hanford, CA 93230**

(9:00-9:30)

- 1) Introductions and Today's Agenda (15 min)

- 2) Review Plan Purpose and Outline (15 min)

(9:30-10:30)

- 3) Results of Risk Assessment (1 hour)
 - Hazard Identification
 - Vulnerability Assessment
 - Key Issues and Problem Areas

Break (15 minutes)

(10:45-12:30)

- 4) Develop Plan Goals and Objectives (1.5 hours)

- 5) Next Steps (15 min)

Sign-In Sheet
Kings County Multi-Hazard Mitigation Plan
Hazard Mitigation Planning Committee Meeting #2
February 22, 2007

Name	Jurisdiction/ Department	Address	Phone	E-Mail
Lon Demsky	ARMOURA CSD		559 240 0300	acsdfo@lemonvale.net
TERRY SIMMONS	TRAKI PALACE		559-382-5411	tsimmons@trakipalace.net
Mrs ROBERTS	LEMONORE P.D.		(559) 924-9574	lrboberts@co.kings.ca.us
Joe Neves	KCBOS			
Thomas Smith	KC Admin		X2518	tsmith@co.kings.ca.us
Paul Colkins	STATE OF CALIFORNIA	2550 MONTANA RD 1818 FRESNO CA 93224	559-445-5806	Paul.Colkins@serica.gov
Keith Seligman	KRCID	4886 E. Jensen Fresno	217-4285	kseligman@krcid.org
Bill Lynch	HANBENS FIRE	350 W. GRANVILLE RD	585-2545	blynch@ci.hanford.ca.us
REBECCA STORNEY	COLEMAN PD.	1031 ATTENDERS AVE.	992-5751	
TRACY CRAMER	COLEMAN PD.	1031 CHATTANOOGA AVE	992-5151	
Tamara Fowler	Kings COE	1144 W. Lacey Blvd	584-1941	travalin@kings.cts.
DOUG DAVIS	COE CD	P.O. Box 985, Coleman	992-3445	ddavis@co.kings.ca.us
Kara Bourds	King County Planning	1400 W. Lacey	582-3211	kbourds@co.kings.ca.us
Helena Whitson	ARMOURA	9195 Kallie, Arroyo	3865746	msmith@trakipalace.net
Debbie Bello	Delta Lands PD 770	PO Box 877 Corcoran	992 5011	dbello@lgsoswell.com
Walter Binder	"	"	"	wbinder@lgsoswell.com

