Chapter 5  Mitigation Strategy

Requirement §201.6(c)(3): [The plan shall include] a mitigation strategy that provides the jurisdiction’s blueprint for reducing the potential losses identified in the risk assessment, based on existing authorities, policies, programs and resources, and its ability to expand on and improve these existing tools.

This section describes the mitigation strategy process and mitigation action plan for the Lake County Local Hazard Mitigation Plan (LHMP) Update. It describes how the County met the following requirements from the 10-step planning process:

➢ Planning Step 6: Set Goals
➢ Planning Step 7: Review Possible Activities
➢ Planning Step 8: Draft an Action Plan

5.1 Mitigation Strategy: Overview

The results of the planning process, the risk assessment, the goal setting, the identification of mitigation actions, and the hard work of the Hazard Mitigation Planning Committee (HMPC) led to the mitigation strategy and mitigation action plan for this LHMP Update. As part of the LHMP Update process, a comprehensive review and update of the mitigation strategy portion of the plan was conducted by the HMPC. Some of the initial goals and objectives from the 2012 plan were refined and reaffirmed, some goals were deleted, and others were added. The end result was a new set of goals, reorganized to reflect the completion of 2012 actions, the updated risk assessment and the new priorities of this LHMP Update.

To support the new LHMP goals, the mitigation actions from 2012 were reviewed and assessed for their value in reducing risk and vulnerability to the planning area from identified hazards and evaluated for their inclusion in this LHMP Update (See Chapter 2 What’s New). Section 5.2 below identifies the new goals and objectives of this LHMP Update and Section 5.4 details the new mitigation action plan.

Taking all of the above into consideration, the HMPC developed the following umbrella mitigation strategy for this LHMP Update:

➢ Communicate the hazard information collected and analyzed through this planning process as well as HMPC success stories so that the community better understands what can happen where and what they themselves can do to be better prepared.
➢ Implement the action plan recommendations of this plan.
➢ Use existing rules, regulations, policies, and procedures already in existence.
➢ Monitor multi-objective management opportunities so that funding opportunities may be shared and packaged and broader constituent support may be garnered.

5.1.1. Continued Compliance with NFIP

Given the flood hazard in the planning area, an emphasis will be placed on continued compliance with the National Flood Insurance Program (NFIP) by all communities and participation by Lake County in the
Community Rating System (CRS). Detailed below is a description of Lake County’s flood management program to ensure continued compliance with the NFIP. Also to be considered are the numerous flood mitigation actions contained in this LHMP that support the ongoing efforts by the County to minimize the risk and vulnerability of the community to the flood hazard and to enhance their overall floodplain management program.

**Lake County’s Flood Management Program**

Lake County has participated in the Regular Phase of the NFIP since October 17, 1978. Since then, the County has administered floodplain management regulations that meet the minimum requirements of the NFIP. Under that arrangement, residents and businesses paid the same flood insurance premium rates as most other communities in the country.

The County will continue to manage their floodplains in continued compliance with the NFIP. An overview of the County’s NFIP status and floodplain management program are discussed on Table 5-1.

**Table 5-1 Lake County NFIP Status**

<table>
<thead>
<tr>
<th>NFIP Topic</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Insurance Summary</strong></td>
<td></td>
</tr>
<tr>
<td>How many NFIP policies are in the community?</td>
<td>1,343 policies</td>
</tr>
<tr>
<td>What is the total premium and coverage?</td>
<td>$300,551,900 of insurance in force</td>
</tr>
<tr>
<td></td>
<td>$1,146,609 in annual premiums</td>
</tr>
<tr>
<td>How many claims have been paid in the community?</td>
<td>745 closed paid losses totaling</td>
</tr>
<tr>
<td>What is the total amount of paid claims?</td>
<td>$9,526,414.42</td>
</tr>
<tr>
<td>How many of the claims were for substantial</td>
<td>44 substantial damage claims since 1978</td>
</tr>
<tr>
<td>damage?</td>
<td></td>
</tr>
<tr>
<td>How many structures are exposed to flood risk</td>
<td>3,563 (1% Annual Chance))</td>
</tr>
<tr>
<td>within the community?</td>
<td>1,045 (0.2% Annual Chance)</td>
</tr>
<tr>
<td>Repetitive Loss and Severe Repetitive Loss</td>
<td>106 Repetitive Loss Properties</td>
</tr>
<tr>
<td>Properties</td>
<td>14 Severe Repetitive Loss Properties</td>
</tr>
<tr>
<td>Describe any areas of flood risk with limited</td>
<td>Undetermined</td>
</tr>
<tr>
<td>NFIP policy coverage</td>
<td></td>
</tr>
<tr>
<td>Is the Community Floodplain Administrator or</td>
<td>Y</td>
</tr>
<tr>
<td>NFIP Coordinator certified?</td>
<td></td>
</tr>
<tr>
<td>Provide an explanation of NFIP administration</td>
<td>Permit review, inspections, engineering</td>
</tr>
<tr>
<td>services (e.g., permit review, GIS, education</td>
<td>review, floodplain determination, BFE</td>
</tr>
<tr>
<td>or outreach, inspections, engineering capability)</td>
<td>determination</td>
</tr>
<tr>
<td>What are the barriers to running an effective</td>
<td>Public disbelief in the flood threat</td>
</tr>
<tr>
<td>NFIP program in the community, if any?</td>
<td></td>
</tr>
<tr>
<td><strong>Compliance History</strong></td>
<td></td>
</tr>
<tr>
<td>Is the community in good standing with the NFIP?</td>
<td>Y</td>
</tr>
<tr>
<td>Are there any outstanding compliance issues (i.e., current violations)?</td>
<td>No</td>
</tr>
<tr>
<td>When was the most recent Community Assistance Visit (CAV) or Community Assistance Contact (CAC)?</td>
<td>CAV 3/2/2012; CAC 8/4/2016</td>
</tr>
<tr>
<td>Is a CAV or CAC scheduled or needed?</td>
<td>N</td>
</tr>
</tbody>
</table>
The Community Rating System (CRS) was created in 1990. Lake County has been in the CRS program since 1995. The program is designed to recognize floodplain management activities that are above and beyond the NFIP’s minimum requirements. CRS is designed to reward a community for implementing public information, mapping, regulatory, loss reduction and/or flood preparedness activities. On a scale of 10 to 1, Lake County is currently ranked Class 7 community, which gives a 15% premium discount to individuals in the Lake County Special Flood Hazard Area (SFHA), and a 5% discount to policyholders outside the SFHA.

The activities credited by the CRS provide direct benefits to Lake County and its residents, including:

- Enhanced public safety;
- A reduction in damage to property and public infrastructure;
- Avoidance of economic disruption and losses;
- Reduction of human suffering; and
- Protection of the environment.

The activities that Lake County implements and receives CRS credits include:

- **Activity 310** – Elevation Certificates: The Lake County Water Resources Department maintains elevation certificates for new and substantially improved buildings. Copies of elevation certificates are made available upon request. Elevation Certificates are also kept for post-FIRM and pre-FIRM buildings. (67 points)
➢ **Activity 320** – Map Information Service: Lake County provides inquirers with basic flood zone information from the community’s latest Flood Insurance Rate Map (FIRM) and additional FIRM information, information about problems not shown on the FIRM, and as available, historical flood information. Records are maintained. (90 points)

➢ **Activity 330** – Outreach Projects: Credit is provided for informational outreach projects that include brochures in public buildings, general outreach projects that include mailer to the entire community, posts on social media and community events, and targeted outreach projects that include letters to repetitive loss areas and flood prone properties. These projects are disseminated annually. Credit is also provided for having a pre-flood plan for public information. Credit is enhanced by having a Program for Public Information (PPI), and by having the information disseminated by stakeholders outside the local government. (350 points)

➢ **Activity 340** – Hazard Disclosure: Credit is provided for the local real estate agents disclosure of flood hazards to prospective buyers. Credit is also provided for state regulations requiring disclosure of flood hazards. Real estate agents provide a brochure advising prospective buyers about insurance and checking property flood hazards. (56 points)

➢ **Activity 350** – Flood Protection Information: Documents relating to floodplain management are available in the reference section of the Lake County Public Library. Floodplain information is available on the County website. Credit is enhanced by having a PPI. (101 points)

➢ **Activity 360** – Flood Protection Assistance: Lake County provides one-on-one advice for property flood protection and performs site visits as needed. Credit is enhanced by having a PPI. (85 points)

➢ **Activity 370** – Flood Insurance Promotion: Credit is provided for assessing the community’s current level of flood insurance coverage and assessing shortcomings. Credit is also provided for development and implementation of a coverage improvement plan, and providing technical advice regarding flood insurance. Credit for implementing a coverage improvement plan is enhanced by having a PPI and stakeholder involvement. (90 points)

➢ **Activity 410** – Floodplain Mapping: Credit is provided for conducting and adopting flood studies for areas not included on the FIRM and that exceed minimum mapping standards. (30 points)

➢ **Activity 420** – Open Space Preservation: Credit is provided for preserving approximately 35 percent of the Special Flood Hazard Area (SFHA) as open space, protecting open space land with deed restrictions, and preserving open space land in a natural state. Credit is also provided for regulations and incentives that minimize development in the SFHA. Credit is enhanced by having a PPI. (1020 points)

➢ **Activity 430** – Higher Regulatory Standards: Credit is provided for enforcing regulations that require development limitations, freeboard for new and substantial improvement construction, foundation protection, cumulative substantial improvement, enclosure limits and local drainage protection. Credit is also provided for the enforcement of building codes, a BCEGS Classification of 3/3, other higher standards, state mandated regulatory standards, and regulations administration. (571 points)

➢ **Activity 440** – Flood Data Maintenance: Credit is provided for maintaining and using digitized maps in the day to day management of the floodplain. Credit is also provided for establishing and maintaining a system of benchmarks and maintaining copies of all previous FIRM and Flood Insurance Study Reports. (227 points)

➢ **Activity 450** – Stormwater Management: Lake County enforces the stormwater ordinance for stormwater management, low impact development, soil and erosion control, and water quality and has a watershed master plan. (261 points)

➢ **Section 502** – Repetitive Loss Category: Based on the updates made to the NFIP Report of Repetitive Losses as of December 11, 2011, Lake County, CA has 123 repetitive loss properties and is a Category C community for CRS purposes. The County has a Floodplain Management Plan. (No credit points are applicable to this section)

➢ **Activity 510** – Floodplain Management Planning: Credit is provided for the adoption and implementation of the Sacramento County Local Hazard Mitigation Plan adopted on December 6, 2011.
A progress report must be submitted on an annual basis. An update to the credited plan will be due by October 1, 2016. Credit is also provided for conducting a repetitive loss area analysis. (404 points)

➢ **Activity 520** – Acquisition and Relocation: Credit is provided for acquiring and relocating 19 buildings from the community’s regulatory floodplain. (74 points)

➢ **Activity 530** – Flood Protection: Credit is provided for 81 buildings that have been elevated to protect them from flood damage. (160 points)

➢ **Activity 540** – Drainage System Maintenance: A portion of the community’s drainage system is inspected regularly throughout the year and maintenance is performed as needed. Credit is also provided for listing problem sites that are inspected more frequently, and for implementing an ongoing Capital Improvements Program. The community enforces a regulation prohibiting dumping in the drainage system, and annually publicizes the regulation. Credit is enhanced by having a PPI. (201 points) The cities inspect their storm drainage systems regularly. Both the cities and the County prohibit dumping into storm drains. Lake County has a PPI for our Storm Water Program.

➢ **Activity 610** – Flood Warning and Response: Credit is provided for a program that provides timely identification of impending flood threats, disseminates warnings to appropriate floodplain residents, and coordinates flood response activities. Credit is also provided for the designation as a Storm Ready Community by the National Weather Service. (241 points)

➢ **Activity 630** – Dams: Credit is provided for a State Dam Safety Program. (37 points) The two Dams operated by the County (Highland Springs and Adobe Creek) are inspected twice per year and we have existing Emergency Action Plans for each.

➢ **Activity 710** – County Growth Adjustment: All credit in the 400 series is multiplied by the growth rate of the county to account for growth pressures. The growth rate for Lake County, CA is 0.70.

### 5.1.2. Integration of Mitigation with Post Disaster Recovery and Mitigation Strategy Funding Opportunities

Hazard Mitigation actions are essential to weaving long-term resiliency into all community recovery efforts so that at-risk infrastructure, development, and other community assets are stronger and more resilient for the next severe storm event. Mitigation measures to reduce the risk and vulnerability of a community to future disaster losses can be implemented in advance of a disaster event and also as part of post-disaster recovery efforts.

Mitigation applied to recovery helps communities become more resilient and sustainable. It is often most efficient to fund all eligible infrastructure mitigation through FEMA’s Public Assistance mitigation program if the asset was damaged in a storm event. Mitigation work can be added to project worksheets if they can be proven to be cost-beneficial.

Integration of mitigation into post disaster recovery efforts should be considered by all communities as part of their post disaster redevelopment and mitigation policies and procedures. As previously described in Section 4.4, the Capability Assessment for the Lake County, post-disaster redevelopment and mitigation policies and procedures are being evaluated and updated as part of the Emergency Operations Plan (EOP) updates for each community and other community efforts.

These EOP’s, through its policies and procedures, seek to mitigate the effects of hazards, prepare for measures to be taken which will preserve life and minimize damage, enhance response during emergencies and provide necessary assistance, and establish a recovery system in order to return the community to their normal state of affairs. Mitigation is emphasized as a major component of recovery efforts. In addition, some of the individual mitigation actions identified for this LHMP Update in Table 5-2 below include...
additional measures for establishing and updating comprehensive post-disaster redevelopment and mitigation policies and procedures that fully integrate loss reduction activities into post disaster recovery efforts.

**Mitigation Strategy Funding Opportunities**

An understanding of the various funding streams and opportunities will enable the communities to match identified mitigation projects with the grant programs that are most likely to fund them. Additionally, some of the funding opportunities can be utilized together. Mitigation grant funding opportunities available pre- and post- disaster include the following.

**FEMA HMA Grants**

Cal OES administers three main types of HMA grants: (1) Hazard Mitigation Grant Program, (2) Pre-Disaster Mitigation Program, and (3) Flood Mitigation Assistance Program. Eligible applicants for the HMA include state and local governments, certain private non-profits, and federally recognized Indian tribal governments. While private citizens cannot apply directly for the grant programs, they can benefit from the programs if they are included in an application sponsored by an eligible applicant.

**FEMA Public Assistance Section 406 Mitigation**

The Robert T. Stafford Disaster Relief and Emergency Assistance Act provides FEMA the authority to fund the restoration of eligible facilities that have sustained damage due to a presidentially declared disaster. The regulations contain a provision for the consideration of funding additional measures that will enhance a facility’s ability to resist similar damage in future events.

**Community Development Block Grants**

The California Department of Housing and Community Development administers the State’s Community Development Block Grant (CDBG) program with funding provided by the U.S. Department of Housing and Urban Development. The program is available to all non-entitlement communities that meet applicable threshold requirements. All projects must meet one of the national objectives of the program – projects must benefit 51 percent low- and moderate-income people, aid in the prevention or clearance of slum and blight, or meet an urgent need. Grant funds can generally be used in federally declared disaster areas for CDBG eligible activities including the replacement or repair of infrastructure and housing damaged during, or as a result of, the declared disaster.

**Small Business Loans**

SBA offers low-interest, fixed-rate loans to disaster victims, enabling them to repair or replace property damaged or destroyed in declared disasters. It also offers such loans to affected small businesses to help them recover from economic injury caused by such disasters. Loans may also be increased up to 20 percent of the total amount of disaster damage to real estate and/or leasehold improvements to make improvements that lessen the risk of property damage by possible future disasters of the same kind.
Increased Cost of Compliance

Increased Cost of Compliance (ICC) coverage is one of several resources for flood insurance policyholders who need additional help rebuilding after a flood. It provides up to $30,000 to help cover the cost of mitigation measures that will reduce flood risk. ICC coverage is a part of most standard flood insurance policies available under NFIP.

5.2 Goals and Objectives

Requirement §201.6(c)(3)(i): [The hazard mitigation strategy shall include a] description of mitigation goals to reduce or avoid long-term vulnerabilities to the identified hazards.

Up to this point in the planning process, the HMPC has organized resources, assessed hazards and risks, and documented mitigation capabilities. The resulting goals, objectives, and mitigation actions were developed based on these tasks. The HMPC held a series of meetings and exercises designed to achieve a collaborative mitigation strategy as described further throughout this section. Appendix C documents the information covered in these mitigation strategy meetings, including information on the goals development and the identification and prioritization of mitigation alternatives by the LHMP Update Steering Committee and HMPC working group.

During the initial goal-setting meeting, the HMPC reviewed the results of the hazard identification, vulnerability assessment, and capability assessment. This analysis of the risk assessment identified areas where improvements could be made and provided the framework for the HMPC to formulate planning goals and objectives and to develop the mitigation strategy for the Lake County Planning Area.

Goals were defined for the purpose of this mitigation plan as broad-based public policy statements that:

➢ Represent basic desires of the community;
➢ Encompass all aspects of community, public and private;
➢ Are nonspecific, in that they refer to the quality (not the quantity) of the outcome;
➢ Are future-oriented, in that they are achievable in the future; and
➢ A time-independent, in that they are not scheduled events.

Goals are stated without regard to implementation. Implementation cost, schedule, and means are not considered. Goals are defined before considering how to accomplish them so that they are not dependent on the means of achievement. Goal statements form the basis for objectives and actions that will be used as means to achieve the goals. Objectives define strategies to attain the goals and are more specific and measurable.

HMPC members were provided with the list of goals from the 2012 plan as well as a list of other sample goals to consider. They were told that they could use, combine, or revise the statements provided or develop new ones, keeping the risk assessment in mind. Each member was given three index cards and asked to write a goal statement on each. Goal statements were collected and grouped into similar themes during the meeting. The goal statements were then grouped into similar topics. New goals from the HMPC were discussed until the team came to consensus. Some of the statements were determined to be better suited as
objectives or actual mitigation actions and were set aside for later use. Next, the HMPC developed objectives that summarized strategies to achieve each goal.

Based on the risk assessment review and goal setting process, the HMPC identified the following mission statement, goals, and objectives, which provide the direction for reducing future hazard-related losses within the Lake County Planning Area.

**Goal 1: Minimize risk and vulnerability of Lake County to hazards and protect lives and prevent losses to property, public health and safety, economy, and the environment.**

- Identify strategies for mitigating hazards to reduce adverse impacts and hazard related losses.
- Update, implement, and enforce all countywide ordinances related to identified hazards of concern.
- Provide protection for existing and future development. Encourage future development in less hazardous areas. Identify solutions that are scalable with envisioned growth of Lake County.
- Provide protection for critical facilities, utilities, and services and minimize disruption.
- Provide protection and stewardship for the environment and natural and cultural resources.
- Provide protection for the County’s primary natural resource and water supply - Clearlake.

**Goal 2: Increase community outreach, education, and awareness of risk and vulnerability to hazards and promote preparedness and self-responsibility to reduce hazard-related losses.**

- Establish a Countywide public information program that utilizes a variety of outreach strategies and mechanisms to reach all Lake County residents and visitors.
- Inform and educate residents and businesses about all hazards they are exposed to, where they occur, what they can do to mitigate exposure or damages.
- Promote more public awareness and understanding of community based mitigation programs and projects.
- Communicate and empower mitigation strategy implementation by all stakeholders.

**Goal 3: Improve communities’ capabilities to prevent/mitigate hazard-related losses and to be prepared for, respond to, and recover from a disaster event.**

- Reduce the number of emergency incidents and disaster occurrences.
- Continued improvements to emergency services and public safety capabilities.
- Regularly maintain and exercise disaster/emergency response plans, with a long-term focus, and coordinate with public and private agencies to prevent and minimize disasters in Lake County. All planning to be consistent with the Lake County General Plan.
- Develop/improve warning, evacuation, and sheltering procedures and information for residents, businesses, visitors, individuals with access and functional needs, and animals, with a focus on high risk areas.
- Increase current service levels.
- Improve/maintain interagency communications (federal, state, local – cities, districts, tribal governments), and emergency communications to the public. Ensure functionality, redundancy, and continuity of communications, information technology, and other critical services and systems.
- Decrease isolation of underserved communities and provide enhanced communications and support during emergencies.
- Increase interoperability; use of shared resources and mutual aid; technology, and jurisdictional cooperation in Lake County.
Goal 4: Increase and maintain wildfire prevention and protection in Lake County.

➢ Created a resilient wildfire community in Lake County.
➢ Reduce the wildfire risk and vulnerability in Lake County.
➢ Reduce life safety issues, property loss, environmental damages and economic impacts associated with wildfires.
➢ Develop a Countywide fuels reduction implementation strategy.
➢ Update, maintain, and implement Community Wildfire Protection Plans in Lake County.
➢ Coordinate comprehensive fire protection strategies among all federal, state, and local agencies and across all property boundaries.
➢ Increase community education, outreach, and awareness of wildfire mitigation strategies, including those to be undertaken by private property owners.
➢ Promote tree mortality mitigation activities.
➢ Promote and enhance fire-fighting capabilities (e.g., access roads, water supply, etc.)

Goal 5: Improve community resiliency to flooding in Lake County

➢ Reduce the flood risk and vulnerability in Lake County.
➢ Reduce life safety issues, property loss, and damages associated with flooding.
➢ Provide protection to critical facilities, infrastructure, and services.
➢ Review appropriate flood protection infrastructure improvements to provide 100-year level of protection where feasible.
➢ Prevent repetitive losses and reoccurring damages from happening.

Goal 6: Maintain FEMA eligibility for grant funding

➢ Assure conformance to federal and state hazard mitigation initiatives and maximize potential for mitigation grants and implementation.
➢ Position jurisdictions and other eligible community applicants for grant funding through monitoring and communicating available grant programs, timelines, and processes to all communities.
➢ Establish mitigation partnerships among public, private, and non-profit agencies and stakeholders.
➢ Enhance collaboration of all agencies to obtain mitigation grants.

5.3 Identification and Analysis of Mitigation Actions

Requirement §201.6(c)(3)(ii): [The mitigation strategy shall include a] section that identifies and analyzes a comprehensive range of specific mitigation actions and projects being considered to reduce the effects of each hazard, with particular emphasis on new and existing buildings and infrastructure.

In order to identify and select mitigation actions to support the mitigation goals, each hazard identified in Section 4.1 was evaluated. Only those hazards that were determined to be a priority hazard were considered further in the development of hazard-specific mitigation actions.

These priority hazards (in alphabetical order) are:

➢ Agricultural Hazards
➢ Aquatic Biological Hazards: cyanobacterial bloom
➢ Aquatic Biological Hazards: quagga mussel
➢ Climate Change
➢ Dam Failure
➢ Drought and Water Shortage
➢ Earthquake
➢ Flood: 1%/0.2% Annual Chance
➢ Flood: Localized/Stormwater
➢ Hazardous Materials Transportation
➢ Landslide and Debris Flows
➢ Levee Failure
➢ Severe Weather: Heavy Rains, Snow, and Storms (winds, hail, lightning)
➢ Volcano
➢ Wildfire

The HMPC eliminated the hazards identified below from further consideration in the development of mitigation actions because the risk of a hazard event in the County is unlikely or nonexistent, the vulnerability of the County is low, or capabilities are already in place to mitigate negative impacts. The eliminated hazards are:

➢ Severe Weather: Extreme Heat
➢ Subsidence

It is important to note, however, that all the Hazards Addressed in this plan are included in the countywide multi-hazard public awareness mitigation action as well as in other multi-hazard, emergency management actions.

Once it was determined which hazards warranted the development of specific mitigation actions, the HMPC analyzed viable mitigation options that supported the identified goals and objectives. The HMPC was provided with the following list of categories of mitigation actions, which originate from the Community Rating System:

➢ Prevention (required to be evaluated)
➢ Property protection
➢ Structural projects
➢ Natural resource protection
➢ Emergency services
➢ Public information

The HMPC was provided with examples of potential mitigation actions for each of the above categories. The HMPC was also instructed to consider both future and existing buildings in considering possible mitigation actions. A facilitated discussion then took place to examine and analyze the options. Appendix C provides a detailed review and discussion of the six mitigation categories to assist in the review and identification of possible mitigation activities or projects. Also utilized in the review of possible mitigation measures is FEMA’s publication on Mitigation Ideas, by hazard type. Prevention type mitigation alternatives were discussed for each of the priority hazards. This was followed by a brainstorming session that generated a list of preferred mitigation actions by hazard.
5.3.1. Prioritization Process

Once the mitigation actions were identified, the HMPC was provided with several decision-making tools, including FEMA’s recommended prioritization criteria, STAPLE sustainable disaster recovery criteria; Smart Growth principles; and others, to assist in deciding why one recommended action might be more important, more effective, or more likely to be implemented than another. STAPLE stands for the following:

- Social: Does the measure treat people fairly? (e.g., different groups, different generations)
- Technical: Is the action technically feasible? Does it solve the problem?
- Administrative: Are there adequate staffing, funding, and other capabilities to implement the project?
- Political: Who are the stakeholders? Will there be adequate political and public support for the project?
- Legal: Does the jurisdiction have the legal authority to implement the action? Is it legal?
- Economic: Is the action cost-beneficial? Is there funding available? Will the action contribute to the local economy?
- Environmental: Does the action comply with environmental regulations? Will there be negative environmental consequences from the action?

In accordance with the DMA requirements, an emphasis was placed on the importance of a benefit-cost analysis in determining action priority. Other criteria used to assist in evaluating the benefit-cost of a mitigation action includes:

- Contribution of the action to save life or property
- Availability of funding and perceived cost-effectiveness
- Available resources for implementation
- Ability of the action to address the problem

In addition to reviewing and incorporating the actions from the 2012 plan, the committee also considered and defined several new actions. A comprehensive review of mitigation measures was performed using the criteria (alternatives and selection criteria) in Appendix C.

With these criteria in mind, HMPC members were each given a set of nine colored dots, three each of red, blue, and green. The dots were assigned red for high priority (worth five points), blue for medium priority (worth three points), and green for low priority (worth one point). The team was asked to use the dots to prioritize actions with the above criteria in mind. The point score for each action was totaled. Appendix C contains the total score given to each identified mitigation action.

The process of identification and analysis of mitigation alternatives allowed the HMPC to come to consensus and to prioritize recommended mitigation actions. During the voting process, emphasis was placed on the importance of a benefit-cost review in determining project priority; however, this was not a quantitative analysis. The team agreed that prioritizing the actions collectively enabled the actions to be ranked in order of relative importance and helped steer the development of additional actions that meet the more important objectives while eliminating some of the actions which did not garner much support.

Benefit-cost was also considered in greater detail in the development of the Mitigation Action Plan detailed below in Section 5.4. The cost-effectiveness of any mitigation alternative will be considered in greater detail.
through performing benefit-cost project analyses when seeking FEMA mitigation grant funding for eligible actions associated with this plan.

Recognizing the limitations in prioritizing actions from multiple jurisdictions and departments and the regulatory requirement to prioritize by benefit-cost to ensure cost-effectiveness, the HMPC decided to pursue actions that contributed to saving lives and property as first and foremost, with additional consideration given to the benefit-cost aspect of a project. This process drove the development of a determination of a high, medium, or low priority for each mitigation action, and a comprehensive prioritized action plan for the Lake County Planning Area.

5.4 Mitigation Action Plan

Requirement §201.6(c)(3)(iii): [The mitigation strategy section shall include] an action plan describing how the actions identified in section (c)(3)(ii) will be prioritized, implemented, and administered by the local jurisdiction. Prioritization shall include a special emphasis on the extent to which benefits are maximized according to a cost benefit review of the proposed projects and their associated costs.

This action plan was developed to present the recommendations developed by the HMPC for how the Lake County Planning Area can reduce the risk and vulnerability of people, property, infrastructure, and natural and cultural resources to future disaster losses. Emphasis was placed on both future and existing development. The action plan summarizes who is responsible for implementing each of the prioritized actions as well as when and how the actions will be implemented. Each action summary also includes a discussion of the benefit-cost review conducted to meet the regulatory requirements of the Disaster Mitigation Act.

Table 5-2 identifies the mitigation actions and lead agency or department for each action. The action plan detailed below contains both new action items developed for this LHMP Update as well as old actions that were yet to be completed from the 2012 plan. Table 5-2 indicates whether the action is new or from the 2012 plan and Chapter 2 contains the details for each 2012 mitigation action item indicating whether a given action item has been completed, deleted, or deferred.

Table 5-2 identifies all mitigation actions for all participating jurisdictions to this LHMP Update. For each mitigation action item included in Table 5-2, the section that follows includes a detailed mitigation implementation strategy by mitigation action. This Chapter includes the mitigation implementation strategy for all County actions.

It is important to note that Lake County has numerous existing, detailed action descriptions, which include benefit-cost estimates, in other planning documents, such as stormwater and drainage plans, community wildfire protection plans/fire plans, and capital improvement budgets and reports. These actions are considered to be part of this plan, and the details, to avoid duplication, should be referenced in their original source document. The HMPC also realizes that new needs and priorities may arise as a result of a disaster or other circumstances and reserves the right to support new actions, as necessary, as long as they conform to the overall goals of this plan.
Further, it should be clarified that the actions included in this mitigation strategy are subject to further review and refinement; alternatives analyses; and reprioritization due to funding availability and/or other criteria. The County and participating communities are not obligated by this document to implement any or all of these projects. Rather this mitigation strategy represents the desires of the community to mitigate the risks and vulnerabilities from identified hazards. The actual selection, prioritization, and implementation of these actions will also be further evaluated in accordance with the CRS mitigation categories and criteria contained in Appendix C.

It should be noted that many of the projects Table 5-2 benefit all jurisdictions whether or not they are the lead agency. Further, many of these mitigation efforts are collaborative efforts among multiple local, state, and federal agencies. In addition, the public outreach action, as well as many of the emergency services actions, apply to all hazards regardless of hazard priority.
# Table 5-2 Lake County Planning Area’s Mitigation Actions

<table>
<thead>
<tr>
<th>Action Title</th>
<th>Goals Addressed</th>
<th>Lead Agency</th>
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<td><strong>Multi-Hazard Actions</strong></td>
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<tr>
<td>Action 1. Integrate Local Hazard Mitigation Plan into Safety Element of General Plan</td>
<td>1, 2, 3, 4, 5, 6</td>
<td>County Planning Department</td>
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<td>Action 2. Enhance Public Education and Awareness of Natural Hazards and Public Understanding of Disaster Preparednes</td>
<td>1, 2, 3, 4, 5, 6</td>
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<td>Action 3. Water Distribution System Reliability</td>
<td>1, 2, 3, 4, 5, 6</td>
<td>Hidden Valley Lake Community Services District, County of Lake, Coastland Civil Engineering</td>
<td>New Action</td>
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<td>Action 4. Water System Storage Reliability</td>
<td>1, 2, 3, 4, 5, 6</td>
<td>Hidden Valley Lake Community Services District, County of Lake, Coastland Civil Engineering</td>
<td>New Action</td>
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<td>Action 5. Backup Power Reliability</td>
<td>1, 2, 3, 4, 5, 6</td>
<td>Hidden Valley Lake Community Services District, County of Lake, Coastland Civil Engineering</td>
<td>New Action</td>
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<td>Action 6. Water Supply Redundancy</td>
<td>1, 2, 3, 4, 5, 6</td>
<td>Hidden Valley Lake Community Services District, County of Lake, Coastland Civil Engineering</td>
<td>New Action</td>
<td>X</td>
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<tr>
<td>Action 7. Install permanent generators at major lift stations and treatment facilities</td>
<td>1, 2, 3, 4, 5, 6</td>
<td>Lake County, Special Districts</td>
<td>New Action</td>
<td>X</td>
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<td>Action 8. Disaster Debris Management Plan</td>
<td>1, 2, 3, 4, 5, 6</td>
<td>Lake County Public Services / Lake County Environmental Health / CalRecycle / Lake County OES</td>
<td>New Action</td>
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**Agricultural Actions**

| Action 9. Identify and Mitigate Agricultural Hazards   | 1, 3, 6          | Environmental Health (CUPA) and the Agricultural Commissioner               | New Action             | X                          | X                          |                                 |              |

**Flood Actions**

<p>| Action 10. Flood Control Reliability                   | 1, 2, 3, 5, 6    | Hidden Valley Lake Community Services District, County of Lake, Coastland Civil Engineering | New Action             | X                          | X                          | X                              |              |</p>
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<tr>
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<td>Action 11. Flood protection projects</td>
<td>1, 2, 3, 5, 6</td>
<td>Lake County Water Resources Department, Community Development Department</td>
<td>New Action</td>
<td>X</td>
<td>X</td>
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<td>Action 12. Cache Creek Discharge Enhancement</td>
<td>1, 2, 3, 5, 6</td>
<td>Lake County Water Resources Department</td>
<td>New Action</td>
<td>X</td>
<td>X</td>
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<td>Action 13. Middle Creek Flood Damage Reduction and Ecosystem Restoration Project</td>
<td>1, 2, 3, 5, 6</td>
<td>Lake County Water Resources Department</td>
<td>New Action</td>
<td>X</td>
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<td>Action 14. Additional Stream Gauges for Flood Prediction</td>
<td>1, 2, 3, 5, 6</td>
<td>Watershed Protection District</td>
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**Wildfire Actions**

<p>| Action 15. Wildlands Fire Prevention Project                    | 1, 2, 3, 4, 6   | Lakeport Fire Protection District /Calfire; BLM/Lake Co. Resource Conservation District; Scotts Valley Water Conservation District; City of Lakeport | New Action             | X                           | X                           |                             |              |
| Action 16. Develop and protect existing infrastructure used to fight wildfire/ Fire-Break and Access Roads | 1, 2, 3, 4, 6   | Lake County, Mountain of Attention Sanctuary                                | New Action             | X                           | X                           |                             |              |
| Action 17. Additional Repeater/Seigler Mountain Repeater       | 1, 2, 3, 4, 6   | Lake County, Mountain of Attention Sanctuary                                | New Action             | X                           | X                           |                             |              |</p>
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<tr>
<td>Action 18. Additional Emergency Response Team/ The Mountain of Attention Fire Brigade</td>
<td>1, 2, 3, 4, 6</td>
<td>Lake County, Mountain of Attention Sanctuary</td>
<td>New Action</td>
<td>X</td>
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<td>Action 19. Replace Redwood Storage Tanks with Steel Tanks</td>
<td>1, 2, 3, 4, 6</td>
<td>Lake County, Special Districts</td>
<td>New Action</td>
<td>X</td>
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<td>Action 20. Countywide Air Curtain Burners</td>
<td>1, 2, 3, 4, 6</td>
<td>Lake County, Special Districts</td>
<td>New Action</td>
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Multi-Hazard Actions

Action 1. **Integrate Local Hazard Mitigation Plan into Safety Element of General Plan**

**Hazards Addressed:** All hazards

**Goals Addressed:** 1, 2, 3, 4, 5, 6

**Issue/Background:** Local jurisdictional reimbursement for mitigation projects and cost recovery after a disaster is guided by Government Code Section 8685.9 (AB 2140). Specifically, this section requires that each jurisdiction adopt a local hazard mitigation plan (LHMP) in accordance with the federal Disaster Mitigation Act of 2000 as part of the Safety Element of its General Plan. Adoption of the LHMP into the Safety Element of the General Plan may be by reference or incorporation.

**Other Alternatives:** No action

**Existing Planning Mechanisms through which Action will be Implemented:** Safety Element of General Plan

**Responsible Office:** Lake County Planning Department

**Priority (H, M, L):** High

**Cost Estimate:** Jurisdictional board/staff time

**Potential Funding:** Local budgets

**Benefits (avoided Losses):** Incorporation of an adopted LHMP into the Safety Element of the General Plan will help jurisdictions maximize the cost recovery potential following a disaster.

**Schedule:** As soon as possible

Action 2. **Enhance Public Education and Awareness of Natural Hazards and Public Understanding of Disaster Preparedness**

**Hazards Addressed:** All (priority and non-priority) hazards

**Goals Addressed:** 1, 2, 3, 4, 5, 6

**Issue/Background:** Lake County plays a key role in public outreach/education efforts to communicate the potential risk and vulnerability of their community to the effects of natural hazards. A comprehensive multi-hazard public education program will better inform the community of natural hazards of concern and actions the public can take to be better prepared for the next natural disaster event.

**Project Description:** A comprehensive multi-hazard outreach program will ascertain both broad and targeted educational needs throughout the community. The County will work with other agencies as appropriate to develop timely and consistent annual outreach messages in order to communicate the risk
and vulnerability of natural hazards of concern to the community. This includes measures the public can take to be better prepared and to reduce the damages and other impacts from a hazard event. The public outreach effort will leverage and build upon existing mechanisms, will include elements to meet the objectives of Goal 2 of this LHMP Update, and will consider:

➢ Using a variety of information outlets, including websites, local radio stations, news media, schools, and local, public sponsored events;
➢ Creating and distributing (where applicable) brochures, leaflets, water bill inserts, websites, and public service announcements;
➢ Displaying public outreach information in County office buildings, libraries, and other public places and events;
➢ Developing public-private partnerships and incentives to support public education activities.

Other Alternatives: Continue public information activities currently in place.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Existing County outreach programs will be reviewed for effectiveness and leveraged and expanded upon to reach the broader region.

Responsible Office: Lake County

Priority (H, M, L): High

Cost Estimate: Annual costs to be determined, and will depend on the scope and frequency of activities and events as well as volunteer participation

Benefits (Losses Avoided): Increase residents’ knowledge of potential hazards and activities required to mitigate hazards and be better prepared. Protect lives and reduce damages, relatively low cost to implement.

Potential Funding: Local budgets, grant funds

Schedule: Ongoing/Annual public awareness campaign

**Action 3. Water Distribution System Reliability**

**Hazards Addressed:** Subsidence; Landslide; Flood: 1%/0.2%; Flood: Localized Stormwater flooding; Earthquake; Wildfire

**Goals Addressed:** 1, 2, 3, 4, 5, 6

**Issue/Background:** The delivery of safe drinking water is dependent upon the safety of the water conveyance system. Buried underground the community of Hidden Valley Lake lies 20 miles of a water distribution system designed to bring safe drinking water to its residents.

In storm events that bring heavy rains, the soil that surrounds this conveyance system weakens. The varied elevations that comprise this community can contribute to the vulnerability of a weakened soil system.
Flooding in low-lying areas, and soil saturation at higher elevations, exacerbate the detrimental effects to mainline pipes that are prone to leakage.

Earthquake events of even smaller magnitudes can vibrate junction points in water mainlines to the point of leakage. The cumulative effect of these smaller earthquakes, as is common in Lake County, has exponential detrimental effects to the drinking water infrastructure.

**Project Description:** The Water Distribution System Reliability project will address the above mentioned hazards in phases.

In order to protect the integrity of the water distribution system, industry standard leak noise correlation techniques will be applied to pinpoint leakage problem areas with a high degree of accuracy. This first phase will include leak identification with specialized equipment, documentation and mapping, and prioritization and benefit analysis of the most vulnerable locations within the infrastructure.

Following this discovery phase, fortification of the most vulnerable areas, to include junction point such as fire hydrants and individual service connections will be conducted.

At the conclusion of project, the Hidden Valley Lake Community Services District will have mitigated the risks to the public of a vulnerable drinking water distribution system.

**Other Alternatives:** Replacing pipes based on the date of install is an alternative that does not necessarily isolate problem areas, and is therefore not cost effective. The technology of acoustic leak detection is unparalleled in the industry, and provides a user-friendly interface to help improve the financial benefit of this tool.

**Existing Planning Mechanism(s) through which Action Will Be Implemented:** Annual budgetary proposal, to include Capital Improvement Plan and Special Projects. Budget adoption to take place at the specified Board of Director’s meeting.

**Responsible Office/Partners:** Hidden Valley Lake Community Services District, County of Lake, Coastland Civil Engineering

**Project Priority:** High

**Cost Estimate:** $2.032M

**Benefits (Losses Avoided):**

- Threat to public safety (insufficient water supply, landslide)
- Wildfire conflagration (insufficient water supply)
- Damage to property (subsidence, landslide, wildfire)
- GHG reduction (insufficient water supply)

**Potential Funding:** FEMA HMGP 404 funding; USDA, State Division of Drinking water, SRF program; In-kind services
**Timeline:** 24 months

**Action 4. Water System Storage Reliability**

**Hazards Addressed:** Wildfire, Drought and Water Shortage, Landslide and Debris Flow, Severe Weather: Heavy Rains and Storms, Flood (1%/2%), Subsidence, Earthquake.

**Goals Addressed:** 1, 2, 3, 4, 5, 6

**Issue/Background:** The very real propensity for wildfire in Hidden Valley Lake is compounded by the density of the community and the proximity to wildland fuels. Wooden water storage structures present a hazard in this environment.

Recent drought conditions have also illustrated the need for sufficient water storage capabilities. Changing environmental conditions such as extended drought conditions necessitate increased water storage to address this hazard.

Heavy rains and winds of winter storms have proven, and continue to present the threat of landslides, debris, flooding, and subsidence. In higher elevations where most water storage tanks are located, the effects of these storms could potentially compromise the tanks’ structural integrity. There is also a tank located in an area subject to flooding.

Since Hidden Valley Lake Community Services District’s (HVLCSD) water tanks are interspersed through the community at key elevation points, the damaging effects of earthquakes to these tanks are increased.

**Project Description:** The Water System Storage Reliability project is a critical and crucial effort for HVLCSD. By simultaneously mitigating the multiple hazards mentioned above, HVLCSD remains focused on ensuring the safety of the community’s drinking water.

This project replaces five redwood tanks with four modern steel tanks. Steel will significantly reduce the potential damages to tanks due to wildfire. Steel tanks holding water will also provide firefighters with sufficient fire flows, and potentially reduce the extent of a wildfire.

Ensuring increased storage capacity not only aids in firefighting, but also guards against potential drought conditions. Meeting our community’s water demands with a readily available stored supply fortifies the beneficial use of Hidden Valley Lake’s natural resources of waterways and aquifers.

The fortification efforts involved in this project protect against the effects of wind and rain from winter storms, which in turn mitigates landslide, debris flow, floods, and subsidence danger, as well as damages from earthquakes. New, strong tanks that are impermeable to harsh weather conditions are less likely to shift.

The HVLCSD remains committed to providing its residents with access to safe reliable drinking water while protecting the natural resources of the area. The Water System Storage Reliability project is a high priority, and is expected to provide the protection needed.
**Other Alternatives:** Replacing only two tanks would be less effective in providing fire protection and redundancy, as well as previously mentioned hazard benefits.

**Existing Planning Mechanism(s) through which Action Will Be Implemented:** Annual budgetary proposal, to include Capital Improvement Plan and Special Projects. Budget adoption to take place at the specified Board of Director’s meeting.

**Responsible Office/Partners:** Hidden Valley Lake Community Services District, County of Lake, Coastland Civil Engineering

**Project Priority:** High

**Cost Estimate:** $4.936M

**Benefits (Losses Avoided):**

- Threat to public safety (tank collapse)
- Flooding (tank collapse)
- Boil water notice (tank collapse)
- Fire damage reduction (insufficient water storage)
- GHG reduction (insufficient water storage)

**Potential Funding:** FEMA HMGP 404 funding; State Division of Drinking water, SRF program; In-kind services

**Timeline:** 30 months

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**Action 5. ** **Backup Power Reliability**

**Hazards Addressed:** Wildfire; Flood: 1%/0.2%; Severe Weather: Wind; Earthquake

**Goals Addressed:** 1, 2, 3, 4, 5, 6

**Issue/Background:** A loss of power can be brought about in a number of ways. Lake County’s history of wildfire, flood, heavy windstorms and earthquakes are a testimony to the high risk of local power loss.

In the event of a grid-tied power loss, Hidden Valley Lake Community Services District’s (HVLCSD) ability to deliver drinking water to the community will be compromised. Three groundwater wells, and three pump stations draw electricity to deliver drinking water to the community. None of these locations have redundant power capabilities. These key areas of the water distribution system represent a risk to the water delivery of approximately 2500 connections.

Given the increase in extreme environmental events in the recent past, the value of implementing power redundancy has also increased.

**Project Description:** The Backup Power Reliability project would place appropriately sized power generators at four water delivery pump stations. In order for water to be made available for households and
firefighters, electricity required to pump up to water tanks would no longer be a weak spot in the water distribution system. This project would also necessarily include the switchgear needed to transition from grid-tied to generator power, as well as assuring proper access into pump locations.

Four generators in these key locations will have a positive effect on the entire community. This integral step in providing water storage to the community as well as fire flows to the firefighting community help to mitigate risks from the aforementioned hazards.

Ensuring the delivery and storage of water is a commitment HVLCSD considers a continual monitoring and management process. HVLCSD remains vigilant in ensuring the reliability of water availability.

Other Alternatives: Rental of trailered generators on an as-needed basis, creates a dependency on the vendor’s inventory, which is likely reduced during periods of extreme environmental events such as wildfire, flood, wind storms, and earthquakes.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Annual budgetary proposal, to include Capital Improvement Plan and Special Projects. Budget adoption to take place at the specified Board of Director’s meeting.

Responsible Office/Partners: Hidden Valley Lake Community Services District, County of Lake, Coastland Civil Engineering

Cost Estimate: $2.712M

Benefits (Losses Avoided):

➢ Threat to public safety (insufficient water supply)
➢ Wildfire conflagration (insufficient water supply)

Potential Funding: FEMA HMGP 404 funding; USDA, State Division of Drinking water, SRF program; In-kind services

Timeline: 30 months

Action 6. Water Supply Redundancy

Hazards Addressed: Multi-hazard (Wildfire; Flood: 1%/2%; Drought and Water Shortage; Severe Weather: Wind and Lightning)

Goals Addressed: 1, 2, 3, 4, 5, 6

Issue/Background: While the location of multiple wells in a single area is efficient from an economy of scale perspective, one catastrophic failure at this location eliminates water availability from the entire community.

The three groundwater wells that provide drinking water for the Hidden Valley Lake Community are adjacent to Putah Creek, and are all within approximately 1000 feet of each other. Electrical service,
pumping capabilities, water main tie-ins, and regular maintenance activities serve as benefits for having the wells in close proximity of each other, but also serve as a liability.

A wildfire in this vicinity would stop water conveyance, as illustrated in the Valley Fire in 2015. Supervisory Controls And Data Acquisition (SCADA) equipment, as well as power delivery are interrupted as a result of wildfire conflagration.

A portion of the groundwater well location is located in the Flood Insurance Rate Map (FIRM), Special Flood Hazard area, and the water mains are conveying this groundwater under the Putah Creek floodway. Flooding near a well or water mains can be problematic in terms of groundwater saturation, sufficient air gap clearance (wells), and water treatment operations.

A result of Putah Creek adjudication, the Settlement Agreement of 1995, closely monitors water rights users’ consumption according to their permits. Since the Hidden Valley Lake Community Services District’s groundwater wells are defined as being under the influence of surface water, there does not currently exist an alternate source of water during extreme climactic events of drought or water shortage.

Severe weather events involving wind and/or lightning can have the same effect on SCADA controls and power meters for the groundwater wells, as the effects of a wildfire.

**Project Description:** The Water Supply Redundancy project would add redundancy and water delivery reliability to the community by developing a new well, and water delivery system in a location two miles away, and not under the influence of Putah Creek.

The discovery process of developing a new well location involves water sampling and pump capacity testing. Once a suitable location is established, the buildout will include drilling of the production well, chlorination system, mixing, booster pumps, SCADA controls, transmission mains, power redundancy, access road, and security measures.

The entire community of Hidden Valley Lake will benefit from this project. The new well and its water delivery system will improve water reliability as it is stored in tanks, and made available to residential households, commercial entities, and firefighters.

A wildfire near the existing groundwater well cluster has a reduced risk to water delivery, and a better chance at faster containment given the enhanced fire flows provided by the additional well.

The new well location and its transmission mains will not be located in a Special Flood Hazard area, and therefore will not pose a risk of failure or complications related to groundwater saturation or water treatment capabilities.

Having a water source that is not located near Putah Creek eliminates the risk of water shortage or drought conditions in that natural waterway. This alternate source of water further insulates the community from this risk.

As a measure of stewardship of natural resources, Hidden Valley Lake Community Services District (HVLCSD) ensures water delivery for its present customers as well as future. Given the strong potential
for development in this particular community of Lake County, a new well within HVLCSD’s sphere of influence is a protection against individual household wells.

**Other Alternatives:** Developing a new water source and rehabilitating an existing groundwater well have been explored. Water quality, comprehensive hazard mitigation, and natural resource protection measures for alternate locations have not all been met with the same benefits as the aforementioned solution.

**Existing Planning Mechanism(s) through which Action Will Be Implemented:** Annual budgetary proposal, to include Capital Improvement Plan and Special Projects. Budget adoption to take place at the specified Board of Director’s meeting.

**Responsible Office/Partners:** Hidden Valley Lake Community Services District, County of Lake, Coastland Civil Engineering

**Project Priority:** Medium

**Cost Estimate:** $3.642M

**Benefits (Losses Avoided):**

- Threat to public safety (insufficient water supply)
- Wildfire conflagration (insufficient water supply)
- Aquifer depletion (failure of existing well cluster)
- Boil water notice (contaminated water)

**Potential Funding:** FEMA HMGP 404 funding; USDA, State Division of Drinking water, SRF program; In-kind services

**Timeline:** 36 months

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**Action 7. Install Permanent Generators at Major Lift Stations and Treatment Facilities**

**Hazards Addressed:** Wildfire, wind, earthquake, power outage

**Goals Addressed:** 1, 2, 3, 4, 5, 6

**Issue/Background:** During events that cause power outages, sewer lift stations shut down causing sewer spills and contamination to land and water. Staff has had dangerously close calls with trees falling on their vehicles while trying to shuffle portable generators from one lift station to another during extreme wind storms.

**Project Description:** Install portable generators at the key lift stations so they can continue to operate in an event and avoid catastrophic contamination.

**Other Alternatives:** Purchase additional portable generators so one can be left at every lift station

**Existing Planning Mechanism(s) through which Action Will Be Implemented:**
Responsible Office/Partners: Lake County, Special Districts

Project Priority: High

Cost Estimate: $3,900,000

Benefits (Losses Avoided): $6,000,000

Potential Funding: Grants and capital reserves

Timeline: As funding permits

**Action 8. Disaster Debris Management Plan**

Hazards Addressed: Multiple

Goals Addressed: 1, 2, 3, 4, 5, 6

Issue/Background: A fully-developed disaster debris management plan has not been prepared. Staff relies upon institutional knowledge and on-the-fly decision making which could delay response and result in improper handling of debris. Additionally, most recent disaster debris cleanup operations have been managed by outside agencies (CalRecycle, USACE, FEMA).

Project Description: The project would involve developing a Disaster Debris Management Plan to aid in the advance planning for debris management and diversion during and after a disaster. The plan may identify topics such as tasks to be undertaken, team and management roles, government agency coordination, pre-disaster assessment, temporary storage sites, waste diversion opportunities, permanent disposal sites, waste hauling considerations, hazardous wastes, funding and mutual aid, and public outreach.

Other Alternatives:

Existing Planning Mechanism(s) through which Action Will Be Implemented:

Responsible Office/Partners: Lake County Public Services / Lake County Environmental Health / CalRecycle / Lake County OES

Project Priority: Medium

Cost Estimate: $50,000

Benefits (Losses Avoided): Reduces risks associated with slow response and/or improper management of potentially hazardous debris waste.

Potential Funding: Unidentified. Possible County of Lake Integrated Waste Management budget.

Timeline: 2-3 years
Agricultural Actions

Action 9.  Identify and Mitigate Agricultural Hazards

Hazards Addressed: Ag hazards (chemical, pesticide and fertilizer use and storage at central locations)

Goals Addressed: 1, 3, 5

Issue/Background: Pear packing facilities use sanitizers/disinfectants during the packing process. Pesticide and fertilizer sales locations store their products at a central location(s).

Project Description: Ensure that these locations have current hazardous material work business plans with Environmental Health and the local fire departments. Annual inspection(s) at the sales locations for proper storage of pesticides.

Other Alternatives: No action

Existing Planning Mechanism(s) through which Action Will Be Implemented: The known facilities have current hazardous material work business plans with Environmental Health and the local fire departments. In addition, the Agricultural Commissioner does annual pesticide audits at the sales location(s).

Responsible Office/Partners: Environmental Health (CUPA) and the Agricultural Commissioner

Project Priority: Medium

Cost Estimate: undetermined

Benefits (Losses Avoided): $20,849,889 (pears) and undetermined for sales location(s)

Potential Funding: undetermined

Timeline: undetermined
**Flooding, Levee Failure, and Localized Flooding Actions**

**Action 10. Flood Control Reliability**

**Hazards Addressed:** Flood: 1%/2%; Flood: Localized Stormwater flooding; Dam failure

**Goals Addressed:** 1, 2, 3, 5, 6

**Issue/Background:** Adjacent to the Putah Creek waterway, the Hidden Valley Lake community is presented with a unique situation during periods of heavy rain. The 25’ levee that separates Putah Creek from the community, also prevents community floodwaters from discharging into the Creek.

Located at the southeast border of Hidden Valley Lake, the flood control station is positioned at a base flood elevation (BFE) of 953 feet. In addition to the pumping station at the top of the levee, this station consists of an earthen detention basin that receives floodwaters from higher elevations in the community via the detention basin spillway. A 72” check valve exists to regulate discharge from this basin. Floodwaters are unable to discharge from the basin when the Putah Creek water surface elevation is higher than the basin’s water surface elevation. In the opposite scenario, when the Putah Creek water surface elevation is not higher than the detention basin, the gate valve has also become problematic when debris prevents the valve from closing.

Similarly, in the event of a dam failure at Hidden Valley Lake, the inundation of water flows and debris from this event will travel to the detention basin as designed, but at this point would potentially “back-up” into the community once the detention basin fills.

**Project Description:** The Flood Control Reliability project will mitigate flooding risk in the areas adjacent to the flood control station. Since Hidden Valley Lake is very densely populated when compared to the rest of Lake County, this mitigation effort is relevant and impactful for community sustainability when considering future development.

This project would replace the existing discharge gate valve with a Tide-Flex valve that better regulates flows and restricts flow back through the detention basin. The “duck bill” design of the Tide-Flex valve opens with positive pressure, and closes to prevent backflow. This implementation has proven successful in innumerable applications since 1984. A temporary diversion structure will be constructed to help facilitate the replacement as well as allow for fortifications of the existing concrete structure.

**Other Alternatives:** A complete removal of the levee at the southern-most border of the community, or the installation of large culverts installed in this area have been investigated. Large expenditures including land acquisition may not provide a cost benefit ratio higher than 1.

**Existing Planning Mechanism(s) through which Action Will Be Implemented:** Annual budgetary proposal, to include Capital Improvement Plan and Special Projects. Budget adoption to take place at the specified Board of Director’s meeting.

**Responsible Office/Partners:** Hidden Valley Lake Community Services District, County of Lake, Coastland Civil Engineering
Project Priority: High

Cost Estimate: $0.634M

Benefits (Losses Avoided):

➢ Threat to public safety (contaminated floodwaters)
➢ Household flooding claims (including multiple flood claims)
➢ Damage to flood control infrastructure
➢ Landslides, erosion, subsidence, debris
➢ Road closures
➢ Evacuation

Potential Funding: FEMA HMGP 404 funding; State Division of Drinking water, SRF program; In-kind services

Timeline: When funding is available

Action 11. Flood protection projects

Hazards Addressed: Flooding

Goals Addressed: 1, 2, 3, 5, 6

Issue/Background: Potential flooding of homes and businesses

Project Description: Continued maintenance of existing levees and drainage culverts; investigate the feasibility of raising the levee elevations to improve the level of flood protection to the 100-year event. Continue to implement the stormwater ordinance, grading ordinance and floodplain management ordinance.

Other Alternatives: No action.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Ordinance enforcement and application; levee maintenance program implementation

Responsible Office/Partners: Lake County Water Resources Department, Community Development Department

Project Priority: The study is funded and awarded.

Cost Estimate: $500,000 for feasibility study; levee maintenance $50,000; levee improvement unknown

Benefits (Losses Avoided): Upper Lake and surrounding homes are better protected from flooding

Potential Funding: State, federal

**Action 12. Cache Creek Discharge Enhancement**

**Hazards Addressed**: Flood (from sustained high water levels on Clear Lake)

**Goals Addressed**: 1, 2, 3, 5, 6

**Issue/Background**: The Grigsby Riffle impedes the discharge of Cache Creek such that the duration of high water events or lake flooding is increased. Widening Cache Creek or dredging the accumulated gravel in the Grigsby Riffle could help reduce the duration of high water on Clear Lake.

**Project Description**: Removal of accumulated gravel would lower the riffle to -2’ Rumsey to allow some increased discharge capacity. Any other modification of the channel would require coordination with Yolo County and reversal or modification of a standing court decree.

**Other Alternatives**: No action.

**Existing Planning Mechanism(s) through which Action Will Be Implemented**: Continued coordination with Yolo County during flood season.

**Responsible Office/Partners**: Water Resources Department

**Project Priority**: Lack of funding lowers the priority of this important flood reduction project

**Cost Estimate**: Unknown

**Benefits (Losses Avoided)**: Reduced duration of flooding for 4243 parcels worth over $932 million.

**Potential Funding**: Grant funding may be an option

**Timeline**: If funding is obtained, the work could be accomplished in 1-2 years.

**Action 13. Middle Creek Flood Damage Reduction and Ecosystem Restoration Project**

**Hazards Addressed**: Nutrient loading in Clear Lake; flooding of agricultural land and residences

**Goals Addressed**: 1, 2, 3, 5, 6

**Issue/Background**: Lake County is under a nutrient TMDL ruling for phosphorus. The Middle Creek project has been identified as a critical component in the attainability of the 40% reduction target. The Middle Creek project would help trap sediment and associated nutrients before they enter Clear Lake.

**Project Description**: The project involves acquisition of 1675 acres and some residences to allow opening of the flood protection levees and consequent restoration of Clear Lake wetlands.

**Other Alternatives**: No action

**Existing Planning Mechanism(s) through which Action Will Be Implemented**: 
**Responsible Office/Partners:** Watershed Protection District

**Project Priority:** This project is critical to meet the nutrient TMDL, but is funding limited.

**Cost Estimate:** $32,000,000

**Benefits (Losses Avoided):** Nutrient load reduction to Clear Lake; wetland habitat restoration

**Potential Funding:** State, perhaps some federal. The County will be required to provide $16,000,000.

**Timeline:** Depends on continued availability of funding from the state or other sources; 20 yrs.

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**Hazards Addressed:** Urban flooding

**Goals Addressed:** 1, 2, 3, 5, 6

**Issue/Background:** Land use and climatic changes may result in increased rate and volume of stormwater runoff. This can increase localized flooding and peak flows. Enhancing the ability to monitor stream elevations could improve the flood prediction accuracy.

**Project Description:** Placement of stream gauges in waterways subject to increased discharge as a consequence of watershed land use changes.

**Other Alternatives:** No action

**Existing Planning Mechanism(s) through which Action Will Be Implemented:** Watershed Protection District flood programming.

**Responsible Office/Partners:** Lake County Water Resources Department

**Cost Estimate:** $30,000 per gauge.

**Benefits (Losses Avoided):** We could better predict peak flood events or timing.

**Potential Funding:** We have funding for one or two gauges; grant funding may be an option for others

**Timeline:** The installation has been on hold until a suitable cross-section can be located

**Project Priority:** Medium
**Wildfire Actions**

**Action 15. Wildlands Fire Prevention Project**

**Hazards Addressed:** Wildfire

**Goals Addressed:** 1, 2, 3, 4, 6

**Issue / Background:** Reference the BLM/CalFire/LFPD wildfire history map, specific impacts of the 1981 Cow Mountain Fire, and increased occupational hazard risks incurred by population/industry expansion in the Wildland/Urban Interface area, and the 2009 Community Wildfire Protection Plan (CWPP). (http://www.co.lake.ca.us/Government/Boards/lcfsc/LCCWPP.htm).

**Project Description:**

- a. 40,000 acres of unmanaged and highly flammable vegetation in the Scotts Creek Watershed/Cow Mt. Recreation Area.
- b. 6,000 acres of agriculturally managed and highly flammable vegetation in the Scotts Valley private properties territories, lying between the Upper Scotts Creek Watershed and the City of Lakeport.
- c. Vulnerable water resources impaired by ultra-high density, flammable vegetation in both above territories.
- d. Limited access to fire suppression resources in both territories (reference the 2007 Municipal Service Review and Sphere of Influence Report for all five Fire Protection Districts in Lake County, provided by the Local Agency Formation Commission, http://www.lakeafco.org/adopted-service-reviews-and-spheres-of-influence.html note that in this report, an additional 30.5 square miles of response territory was included in the LFPD’s sphere of influence, whose ability to protect Scotts Valley and the City of Lakeport residents is directly affected by the known high-risk hazard conditions).

**Other Alternatives:** Catastrophic wildfires, Lakeport area

**Existing Planning Mechanism(s) through which Action will be Implemented:** Community Wildfire Plan 2009

**Responsible Office/Partners:**

- Lakeport Fire Protection District / Calfire
- BLM / Lake Co. Resource Conservation District
- Scotts Valley Water Conservation District
- City of Lakeport

**Project Priority:** Very High

**Cost Estimate:** $10,000 to $12,000, proposal assembly, document production, reproduction, distribution and approval cycle.
Benefits (Losses Avoided): Prevent destruction of federal recreation area (BLM), water resources (private property and City of Lakeport water supplies), destruction of City of Lakeport (county seat), prevention of loss of wildlife resources.

Potential Funding: FEMA

Timeline: One year process resulting in (a) prioritized list of action plans for subsequent funding and implementation and (b) application for DHS or other funding to implement fuel load reduction, emergency service access improvements, property owner stewardship education and advocacy, community participation to implement CWPP in areas served by the Lakeport Fire Protection District.

**Action 16. Develop and protect existing infrastructure used to fight wildfire/ Fire-Break and Access Roads**

Hazards Addressed: Wildfire

Goals Addressed: 1, 2, 3, 4, 6

Issue/Background: Insuring Cal Fire has access to valuable fire-fighting water and strategic fire breaks/ The communities of northern Middletown, western Lower Lake, southern Kelseyville, and Loch Lomond are extremely susceptible to the devastating effects of wildfire. The fire water supply system at The Mountain Of Attention Sanctuary, which includes over 80,000 gallons of water in two reservoirs, 20 hydrants, and two several acre ponds are a resource Cal Fire uses regularly to combat wildfire in the above mentioned communities. Road repairs are required to insure these valuable assets are fully accessible. In addition to these water resources, several strategic fire-break roads, including one which has a heli-pad and was designed and cut by Cal Fire are in need of repair. In addition, to the repair of these fire-break roads, we would like to develop another fire-break road, which Cal Fire, has told us is very important to aide in the immediate protection of the Shenandoah Road housing development as well as the greater communities mentioned above.

Project Description: Repair 9000 feet of access/ fire-break road and create 8050 feet of new fire-break road.

Please see additional document titled “Additional Description of Firebreak and Access Roads” and endorsements by the Cobb Area Council, South Lake Fire, and Jim Harvey a highly respected licensed forester.

Other Alternatives: No action

Existing Planning Mechanism(s) through which Action Will Be Implemented: This Action Plan will be implemented by Adidam and managed by John Colon. John Colon has a long resume of managing large projects. He recently managed a 2.3 million dollar forestry reparation project and has successfully managed projects with budgets of over 20 million dollars.

Responsible Office/Partners: Lake County, Mountain of Attention Sanctuary
Project Priority: High Priority

Cost Estimate: $250,000 to $300,000

Benefits (Losses Avoided): Losses avoided include several hundred homes, important forested areas, the last existing previous famous hot spring resort of Lake County, and Native American Archaeological Sites.

Potential Funding: FEMA grant

Timeline: Begin Spring 2018 through Winter 2019

Action 17. Additional Repeater/Seigler Mountain Repeater

Hazards Addressed: Wildfire

Goals Addressed: 1, 2, 3, 4, 6

Issue/Background: In the Seigler Springs, Loch Lomond, and Cobb Area communications utilities may be lost in a disaster. This repeater will allow emergency response teams and local populations the ability to communicate in the event of disaster. Using this system, important emergency action communications will be transmitted to a variety of important agencies both public and private.

Project Description: Install a solar powered repeater station on Seigler Mountain, which will serve the greater Cobb area and extend radio communications into the Clearlake and Lower Lake areas.

Other Alternatives: No action

Existing Planning Mechanism(s) through which Action Will Be Implemented: This Action Plan will be implemented by Adidam and managed by John Colon. John Colon has a long resume of managing large projects. He recently managed a 2.3 million dollar forestry reparation project and has successfully managed projects with budgets of over 20 million dollars. This project is supported by the Cobb Area Council.

Responsible Office/Partners: Lake County, Mountain of Attention Sanctuary

Project Priority: High

Cost Estimate: $35000 to $45000

Benefits (Losses Avoided): This repeater system can help prevent the loss of life and property in any catastrophic event.

Potential Funding: FEMA

Timeline: Spring 2018 through Winter 2019
**Action 18. Additional Emergency Response Team/ The Mountain of Attention Fire Brigade**

**Hazards Addressed:** Wildfire

**Goals Addressed:** 1, 2, 3, 4, 6

**Issue/Background:** The Mountain of Attention Sanctuary has an established fire brigade. These highly trained personnel protect The Mountain of Attention Sanctuary and its important community assets in the face of catastrophic events. This fire brigade needs additional equipment and training to be more effective in catastrophic events.

**Project Description:** Purchase several portable fire pumping stations, personal protective equipment, and create an emergency shelter in place structure.

**Other Alternatives:** No action

**Existing Planning Mechanism(s) through which Action Will Be Implemented:** This Action Plan will be implemented by Adidam and managed by John Colon. John Colon has a long resume of managing large projects. He recently managed a $2.3 million forestry reparation project and has successfully managed projects with budgets of over $20 million. This project is supported by the Cobb Area Council.

**Responsible Office/Partners:** Lake County, Mountain of Attention Sanctuary

**Project Priority:** High

**Cost Estimate:** $35000 to $75000

**Benefits (Losses Avoided):** This team can help prevent the loss of life and property in any catastrophic event.

**Potential Funding:** FEMA

**Timeline:** Spring 2018 through Winter 2019

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**Action 19. Replace Redwood Storage Tanks with Steel Tanks**

**Hazards Addressed:** Wildfire

**Goals Addressed:** 1, 2, 3, 4, 6

**Issue/Background:** Water storage tanks are located in remote, wilderness areas and are subject to wildfire. The redwood tanks are subject to burning and all storage capabilities would be lost for public consumption, fire suppression and repopulation.

**Project Description:** Replace all wooden tanks with steel tanks. Would include seismic and engineering design as required for specific tanks and locations.
Other Alternatives: Interties with other public water systems.

Existing Planning Mechanism(s) through which Action Will Be Implemented:

Responsible Office/Partners: Lake County, Special Districts

Project Priority: High

Cost Estimate: $1,000,000

Benefits (Losses Avoided): $3,000,000

Potential Funding: Grants and capital reserves

Timeline: Spring 2018 through Winter 2019

**Action 20. Countywide Air Curtain Burners**

Hazards Addressed: Hazardous fuels and defensible space

Goals Addressed: 1, 2, 3, 4, 6

Issue/Background: Large diameter and large project fuels are hard to get rid of. Air curtain burners are an efficient and relatively clean way to get rid of fuels created by fire safety projects. Many of these projects create fuels that are too large for chippers or exhaust the capacity for local chipping companies. It is possible to generate power with this technology

Project Description: Place 2-3 permanent or temporary air curtain burners around the county (North Shore, Lakeport/Kelseyville and South Lake. Fund staff or volunteers to operate the units on a seasonal basis.

Other Alternatives: Chipping, grinding, transporting out of county, leaving it to rot naturally

Existing Planning Mechanism(s) through which Action Will Be Implemented: Air Quality management plan, CEQA

Responsible Office/Partners: OES/Fire agencies, LCAQMD

Project Priority: Medium

Cost Estimate: $400,000 startup, $40,000 annual operating costs - Above Ground Self Contained Air Curtain Burners (FireBox Models S-111 to S-327 powered by either Diesel Engine or Electric Motor): $82,000 to $166,000; B. T-300 Trench Burner: Approx. $42,000; BurnBoss (T-24): Approx. $53,000; C. Roll-off FireBox: $89,000 to $122,000; D. Electric Power Generating Firebox (PGFireBox 100 kW to 1 MW): Approx. $700,000 to $3,800,000

Benefits (Losses Avoided): Reduction of large woody debris, possible power generation
Potential Funding: Carbon credits, FEMA grants, PG&E

Timeline: 1 year to set up, no end date