

DRAFT

**Hazard Mitigation Plan
Community of Crestline Village Water
District, CA**



*Providing our community with a reliable water system
that delivers high quality water for its health and safety needs.*

Primary Point of Contact

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Section 1 – Introduction

1.1 Purpose of the Plan

Emergencies and disasters cause death or leave people injured or displaced, cause significant damage to our communities, businesses, public infrastructure and our environment, and cost tremendous amounts in terms of response and recovery dollars and economic loss.

Hazard mitigation reduces or eliminates losses of life and property. After disasters, repairs and reconstruction are often completed in such a way as to simply restore to pre-disaster conditions. Such efforts expedite a return to normalcy; however, the replication of pre-disaster conditions results in a cycle of damage, reconstruction, and repeated damage. Hazard mitigation ensures that such cycles are broken and that post-disaster repairs and reconstruction result in a reduction in hazard vulnerability.

While no one can prevent disasters from happening, their effects can be reduced or eliminated through a well-organized public education and awareness effort, preparedness, and mitigation. For those hazards which cannot be fully mitigated, the Crestline Village Water District (District) must be prepared to provide efficient and effective response and recovery.

1.2 Authority

As required by the Federal Emergency Management Agency (FEMA), all Hazard Mitigation Plans (HMP) must be updated, adopted and approved every five (5) years; the District's current HMP expired March 08, 2017. The purpose of the update is to validate and incorporate new information into the plan and identify progress that has been made since the last approval of the plan. It should also be noted that an approved HMP is required to receive federal assistance under the Hazard Mitigation Grant Program (HMGP) or Pre-Disaster Mitigation (PDM) programs.

1.3 Community Profile

This section provides a broad perspective, brief history and describes the makeup and development of the community.

1.3.1 Physical Setting

The San Bernardino Mountains, part of the Transverse Ranges, San Bernardino Co., S Calif., extending c.60 mi/97 km E-W N of San Bernardino, continuation of San Gabriel Mts. to W; 34°07'N 116°54'W. Notable peaks are San Bernardino Mt. (10,864 ft/3,311 m) and Mt. San Gorgonio (11,490 ft/3,502 m).

This region embraces the mountain resort and recreational areas around Gregory, Arrowhead, and Big Bear lakes, in San Bernardino National Forest. Mojave Desert is to N and E.

The mountain area served by Crestline Village Water District runs West to East between Cedarpines Park and Twin Peaks. It is bordered on the north and south by the San Bernardino National Forest. The elevation ranges between 4500 and 5200 feet, with a mix of brush and conifer trees.

The urban/wild land interface areas in which the San Bernardino National Forest Boundary meets the private land within the District have steep slopes, often exceeding 30%. The entire area is an extreme fire hazard area as designated by the Crest Forest Fire Protection District, San Bernardino County and the California Division of Forestry. Natural hazards are prevalent throughout the region.

The orientation of the San Bernardino Mountain Range provides for extreme fire weather, especially in the fall of each year. The Santa Ana winds, often in excess of 75 miles per hour produce low humidity and transmit burning embers and firebrands ahead of fire fronts. These winds are also responsible for high temperatures which reduce the fuel moisture of surrounding vegetation.

During the winter months the cold fronts which approach from the southwest release moisture as they lift over the mountains. This can often produce double digit rainfall amounts per storm. Northerly winds usually follow storm events which clear out the area.

1.3.2 History

The Crestline Village Water District was formed February 1, 1954, for the purpose of providing water for residential and fire protection use in the Crestline area. The District covers approximately 4 square miles in the San Bernardino Mountains and serves water to the Crestline and Lake Gregory areas.

During the 1970s and 1980s, the District expanded to include other smaller water purveyors such as Lake Gregory Water Company, Clifton Heights, Mile High Park and Stewart Ranch.

During the growth period, the District engaged in several large construction projects to achieve the following goals:

- To improve existing water systems
- To expand its distribution system

The District also increased the number of storage tanks, wells and pump stations to accommodate the growth.

Today, Crestline Village Water District now services approximately 4,950 homes and businesses.

1.3.3 Existing Land Use

Crestline has a unique climate for Southern California; it has four distinct seasons. In the summer, it is about twenty degrees cooler than the Valley floor with summer highs generally in the 80 to 90's. In the winter, nighttime temperatures regularly dip below freezing but are usually above freezing by 9 A.M., with an average winter high in the 50's. Average rainfall is 37 inches a year, which are three to four times' typical rainfall in the Southern California area. Average snowfall is 60 inches a year starting in late November and ending in March with a surprise Mother's Day Spring storm from time to time.

Crestline Village Water District is generally located along the rim of the San Bernardino Mountains in the upper region of the watershed area that feeds the Santa Ana River Basin to the south and the Mojave River Basin to the north. There are no rivers that flow through the area.

Santa Ana River Basin: Surface waters start in the upper erosion zone of the watershed, primarily the San Bernardino and San Gabriel Mountains. This upper zone has the highest gradient and soils/geology that do not allow large quantities of percolation of surface water into the ground. Flows consist mainly of snowmelt and storm runoff from the lightly developed San Bernardino National Forest; this water is generally high quality at this point. In this zone, the Santa Ana River is generally confined in its lateral movement, contained by the slope in the mountainous regions.

Mojave water region: The Mojave River has its headwaters in the San Bernardino Mountains, in the northern portion of the District. High rainfall and snowfall in these mountains produce much of the water that forms the headwaters of the Mojave River.

Rivers/Lakes: Lake Gregory is the primary body of water in the District. Water runoff from the surrounding areas of Lake Gregory, Crestline, San Moritz and Twin peaks enter here. Lake Gregory overflows into Houston Creek and out to the Mojave River Basin.

1.3.4 Demographics

The District's 2015 Urban Water Management Plan estimates the full-time population to be about 7,607, however there is a strong seasonal factor which pushes the peak population to an estimated 13,200.

96% of the total water connections service residential properties.

1.3.5 Development Trends

There are few properties in the District's current service area that would provide future development. The current growth rate of .25% is expected to continue.

Tourism is a primary economic generator for the area contributing hundreds of thousands of dollars a year, and providing full time as well as part time jobs for local residents. The entire resort area of the San Bernardino mountains, from Crestline to Big Bear plays host to over five million visitors per year, primarily part time vacation homeowners, their friends and guests, and travelers from the Southern California area.

The area offers a good selection of guest accommodations for overnight visitors as well as many individual cabin rental and property management agencies. Ski packages, weddings and eco-tourism are major sources of visitor growth. The area is also popular for business conferences and inter-city cultural and educational exchanges.

The District has approximately 156 commercial business accounts.

Estimates are that about 50% of the employed people who live in Crestline and the surrounding areas commute down the mountain on a daily basis. Major employers in the area are:

Local Service Major Employers:

- Rim of the World School District
- Mountains Community Hospital
- Goodwins Market
- Jensens Market
- Rim Forest Lumber Company
- San Bernardino County Fire
- Lake Arrowhead Community Services District
- Southern California Edison
- The Gas Company
- Crestline-Lake Arrowhead Water Agency
- Crestline Sanitation District
- San Bernardino County
- Crestline Village Water District
- US Forest Service
- Local Camps and Conference Centers
- Local Real Estate, Title & Mortgage Companies
- Burrtec-Mountain Disposal

There is limited industry in the Crestline area. The major industries are the home building industry and service providers for local residents and tourism.

Section 2: Plan Adoption

2.1 Adoption by Local Governing Body

The 2017 Hazard Mitigation Plan (HMP) has been sent to FEMA and Cal-EMA for approval pending adoption of the plan by resolution.

The Crestline Village Water District prepared this local HMP as part of the San Bernardino Operational Area Multi-Jurisdictional Multi-Hazard Mitigation Plan.

2.2 Promulgation Authority

The five-member Board of Directors consists of members within the community who are elected at large. The Board of Directors serves four year terms, with terms overlapping. The Board of Directors develops the policies that govern the District. The District's General Manager is appointed by the Board of Directors and oversees the day-to-day operations of the District.

This Hazard Mitigation Plan was reviewed and approved by the following Promulgation Authorities:

Karl B. Drew
General Manager
Secretary to the Board

Description of Involvement: General Manager and Secretary to the Board of Directors. Authorized signature on behalf of the Board of Directors after the plan is adopted.

Contact Information:
Crestline Village Water District
PO Box 3347
Crestline, CA 92325-3347
909-338-1727
kbdrew@cvwater.com

The public is invited to join the District's Board meetings, which are held at 3:00 pm on the third Tuesday of each month at the District office.

2.3 Primary Point of Contact

The Point of Contact for information regarding this plan is:

Alan E. Clanin
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Section 3: Planning Process

The purpose of this section is to document the planning process that was taken to review, revise, and update the 2011 HMP. A comprehensive description of the planning process not only informs citizens and other readers about how the plan was developed, but also provides a permanent record of how decisions were reached so it can be replicated or adapted in future plan updates. An integral part of the planning process is documentation of how the public was engaged through the process.

This HMP was completed with the coordination and involvement in the San Bernardino Operational Area Multi-Jurisdictional Multi-Hazard Mitigation Plan Update planning efforts. The update process was done with the assistance of a local Planning Team, consisting of members within the District who had a vested interest and were appropriate for the level of knowledge required for the local HMP. For example, one person on the planning team has been with the District since 1995 and knew the history of previous hazards affecting the District.

This section includes a list of the planning team members, a summary of the meetings held, coordination efforts with surrounding communities/groups, and all Public Outreach efforts.

3.1 Preparing the Plan

The District's local planning team reviewed the existing 2011 HMP and Crosswalk to determine which sections of the plan needed to be updated. Once the planning team had reviewed these documents and added any new hazard and mitigation program information, recommendations were presented for public for review and input.

The update process consisted of:

- Documenting actions since 2011;
- Incorporating new data;
- Engaging the Planning Team;
- Conducting Public Outreach; and
- Adoption of the Updated HMP.

To provide a better understanding of the Planning Process and give a timeframe of the effort, Table 1 shows the draft timeline for preparing the Draft HMP for the District and the *San Bernardino County Operational Area Multi-Jurisdictional Multi-Hazard Mitigation Plan*, discussed further in the following sections.

Table 1: Timeline

	2016					2017																													
	June					October					February					March					April					May									
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
Meeting(s)																																			
HMP Training																																			
Working Group																																			
Stakeholder Group																																			
Review 2011 SB Co HPM and Crosswalk																																			
Establish Planning Team																																			
Initial Public Outreach																																			
Update the 2011 HMP																																			
Chapter 1- Introduction																																			
Chapter 2- Plan Adoption																																			
Chapter 3- Planning Process																																			
Chapter 4- Risk Assessment																																			
Chapter 5- Community Capability Assessment																																			
Chapter 6- Mitigation Strategy																																			
Chapter 7- Plan Maintenance																																			
Second Public Outreach and Comment Period																																			
Incorporate Revisions																																			
Upload HMP Update on portal																																			
ICF Team Comments																																			
Revise HMP																																			
Submit to SB County OES for transmission to CAL EMA																																			
Submit to CAL EMA for approval																																			
Submit to FEMA for approval pending adoption																																			
Adoption by Local Governing Body																																			
FEMA Approval																																			
Hazard Mitigation Plan Training																																			

In Person
 Conf Call
 Deadline
 Planning Team

3.1.1 Planning Team

This Hazard Mitigation Plan was compiled and authored by members of the following Planning Team:

Alan E. Clanin

Assistant General Manager

Description of Involvement: Assistant General Manager. Planning Team Coordinator and Contact.

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Larrie Ann Davis
Office Manager

Description of Involvement: Office Manager. Planning Team Co-Coordinator and Administration/Financial Contact.

Contact Information:

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PO Box 3347, 777 Cottonwood Drive
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Steven D. Wood
Field Supervisor

Description of Involvement: Field Operations Supervisor. Provide assistance in identifying infrastructure of water system.

Contact Information:

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909-338-1727
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3.2 Coordination with Other Jurisdictions, Agencies, and Organizations

San Bernardino County Fire Protection District Office of Emergency Services (OES) is coordinating the update of the *San Bernardino County Operational Area Multi-Jurisdictional Multi-Mitigation Plan*. The current *San Bernardino County Operational Area Multi-Jurisdictional Multi-Hazard Mitigation Plan* process consists of information from 31 local HMPs, which are included as an annex to the County's Operational Area plan. The 31 participants include incorporated cities and towns, special districts, and the unincorporated county. The District is a participating special district within the San Bernardino County OES *Multi-Jurisdictional Multi-Hazard Mitigation Plan*.

The District participated in video conference meetings to coordinate and receive support for their HMP Update with the County's Multi-Jurisdictional Multi-Hazard Mitigation Plan. The support included receiving technical expertise, resource material and tools, not only to expedite the HMP update process, but also to ensure that the updates are in compliance with federal requirements of the program. The tools, resource material, and other project related information was maintained on a project portal (<http://mitigatehazards.com/bdc/sb-risk>) to ensure the same information is available to all participants.

Interaction with other local water purveyors and utilities proved valuable in the development of the mitigation projects for the plan. Since one such local water agency is a wholesaler of water to Crestline Village Water District, a joint effort by both purveyors could provide a cost savings by coordinating the mitigation efforts.

Crestline Lake Arrowhead Water Agency

Description of Involvement: Provide assistance in identifying water availability.

Contact Information:

Crestline Lake Arrowhead Water Agency
PO Box 3880, 24116 Crest Forest Drive
Crestline, CA 92325
909-338-1779

Crestline Sanitation District

Description of Involvement: Provide General Information.

Contact Information:

Crestline Sanitation District
PO Box 3895, 24516 Lake Drive
Crestline, CA 92325
909-338-1751

San Bernardino County Department of Public Works

Local Street Maintenance Yard

Description of Involvement: Provide General Information.

Contact Information:

San Bernardino County Department of Public Works
23188 Crest Forest Drive
Crestline, CA 92325
909-338-2140

3.3 Public Involvement/Outreach

An effort was made to solicit public input during the planning process and at three public meetings, which were held during the formation of the plan: on February 21, 2017, on March 21, 2017 and April 21, 2017, to hear public comments. For the public meetings, agendas were posted 72 hours prior to the meetings, as well as announcement notices to the local newspapers. Citizens could also access the District's website (www.cvwater.com) to get updates or provide input to the HMP update.

Because the District's exact location of facilities is extremely sensitive, especially due to increased concerns for national security, only general locations have been included in this report.

Please see **Appendix A** for the details of the public involvement process such as the meeting dates, purpose, agendas, minutes and more.

3.4 Assess the Hazard

This HMP has been developed through an extensive review of available information on hazards, the District's Emergency Response Plan, the District's 2015 Urban Water Management Plan, aerial photographs and available geotechnical and geologic data both from the District and outside sources (for example, California Geological Survey for detailed fault investigation reports).

The assessment of the various hazards was completed by the planning team for the District because they had over 45 years of personal experience at working for the District and knew the history of past hazardous events.

3.5 Set Goals

The goals for the 2017 HMP were set by the planning team for the District because the members of the team knew the goals of the District with respect to its mission "to economically protect, safeguard, and deliver to our customers water at the lowest, reasonable price."

3.6 Review and Propose Mitigation Measures

Again, the District's planning team proposed and reviewed the mitigation measures because they knew the District's mission.

3.7 Draft the Hazard Mitigation Plan

The updated HMPs will be reviewed against a FEMA-designed Crosswalk. The Crosswalk links the federal requirements, the section in the HMP where the information can be found, and a rating as to the level of compliance with the regulation.

3.8 Adopt the Plan

After the Draft HMP was reviewed and finalized by the District's planning team and approved by San Bernardino County-OES and FEMA, the 2017 HMP will be submitted to the District's Board for approval.

Section 4: Risk Assessment

The goal of mitigation is to reduce the future impacts of a hazard including property damage, disruption to local and regional economies, and the amount of public and private funds spent to assist with recovery. However, mitigation should be based on risk assessment.

The purpose of this section is to describe the methodology taken to understand the hazards in the District's service area. There are generally four (4) steps in this process: 1) identify and screen the hazards; 2) profile the hazards; 3) inventory the assets; and 4) estimate losses.

A risk assessment involves measuring the potential loss from a hazard event by assessing the vulnerability of buildings, infrastructure and people. It identifies the characteristics and potential consequences of hazards, how much of the District could be affected by a hazard, and the impact on District assets. A risk assessment consists of three components: hazard identification, vulnerability analysis and risk analysis. Technically, these are three different items, but the terms are sometimes used interchangeably.

4.1 Hazard Identification

4.1.1 Hazard Screening Criteria

The intent of screening the hazards is to help prioritize which hazard creates the greatest concern to the District. The process that was implemented is logical and can be universally applied.

For this 2017 HMP Update, the District is utilizing a numerical ranking system for the hazard screening process.

Natural and man-made hazards considered by the District's planning team include the following:

- Wildfires
- Earthquake
- Drought
- Infestation
- Climate Change
- Terrorism
- Winter Storms
- Flooding
- Dam Inundation

The following natural hazards were considered not to be a risk to the District's planning team:

- Extreme Heat
- Flash Flooding
- High Winds/Straight Line Winds
- Lightning
- Severe Thunderstorms

4.1.2 Hazard Assessment Matrix

For this 2017 HMP Update, the District is utilizing a numerical ranking system for the hazard screening process. This process consists of generating a numerical ranking (similar to High= 4, Likely= 3, Possible= 2 and Unlikely= 1) rating for the probability and impact of each screened hazard.

The risk factors for each hazard include five variables: (1) Probability, (2) Impact (3) Spatial Extent, (4) Warning Time and (5) Duration. Using these five variables, the District's planning team screened each of the hazards using the criteria presented in the previous section. For each of the District's screened hazards,

For **Probability**, the rating options are:

- **Rating of 1= Unlikely** (Less than 1% annual probability).
- **Rating of 2= Possible** (Between 1 & 10 % annual probability).
- **Rating of 3= Likely** (Between 10 & 100% annual probability).
- **Rating of 4= Highly Likely** (100% annual probability).

For **Impact**, the rating options are:

- **Rating of 1= Minor** (very few injuries, if any. Only minor property damage & minimal disruption on quality of life. Temporary shutdown of critical facilities).
- **Rating of 2= Limited** (Minor injuries only. More than 10% of property in affected area damaged or destroyed. Complete shutdown of critical facilities for more than one day).
- **Rating of 3= Critical** (Multiple deaths/injuries possible. More than 50% of property in affected area damaged or destroyed. Complete shutdown of critical facilities for more than one week).
- **Rating of 4= Catastrophic** (High number of deaths/injuries possible. More than 25% of property in affected area damaged or destroyed. Complete shutdown of critical facilities for 30 days or more).

For **Spatial Extent**, the rating options are:

- **Rating of 1= Negligible** (Less than 1% of area affected).
- **Rating of 2= Small** (Between 1 & 10% of area affected).
- **Rating of 3= Moderate** (Between 10 & 50% of area affected).
- **Rating of 4= Large** (Between 50 & 100% of area affected).

For **Warning Time**, the rating options are:

- **Rating of 1= More Than 24 Hours**
- **Rating of 2= 12 to 24 Hours**
- **Rating of 3= 6 to 12 Hours**
- **Rating of 4= Less Than 6 Hours**

For **Duration**, the rating options are:

- **Rating of 1= Less Than 6 Hours**
- **Rating of 2= Less Than 24 Hours**
- **Rating of 3= Less Than 1 Week**
- **Rating of 4= More Than 1 Week**

The hazards are then placed in the appropriate/corresponding box/cell of the corresponding “Hazard Matrix”. The table below is an example of the screening matrix used.

Table 2: Example Hazard Screening Matrix

Rank	Natural Hazards	Probability (1-4)	Factor1 = (Probability Index * .30)	Impact (1-4)	Factor2 = (Impact Index * .30)	Spatial Extent (1-4)	Factor3 = (Spatial Extent Index * .20)	Warning Time (1-4)	Factor4 = (Warning Time Index * .10)	Duration (1-4)	Factor5 = (Probability Index * .10)	RF Factor Total = (Add Factors 1-5)
			0		0		0		0		0	0

4.1.3 Hazard Prioritization

The following sections present each hazard being evaluated by the District and a general definition of the hazard and a description of how the hazard has effected/impacted the District in the past.

4.2 Hazard Profile Description

4.2.1 Wildfires Hazard

The following section describes the hazard and then details the historical events associated with this hazard for the Crestline Village Water District.

General Definition: There are three different classes of wild land or wildfires. A surface fire is the most common type and burns along the floor of a forest, moving slowly and killing or damaging trees. A ground fire is usually started by lightning and burns on or below the forest floor. Crown fires spread rapidly by wind and move quickly by jumping along the tops of trees. Wildfires are usually signaled by dense smoke that fills the area for miles around. Wildfires present a significant potential for

disaster in the southwest, a region of relatively high temperatures, low humidity, and low precipitation during the summer, and during the spring, moderately strong daytime winds. Combine these severe burning conditions with people or lightning and the stage is set for the occurrence of large, destructive wildfires.

Description: Crestline and other mountain communities are surrounded by the San Bernardino National Forest.

The 2007 wildfire season in southern California burned over 1,000,000 ac (400,000 ha) and included several megafires. We use the 2007 fires as a case study to draw three major lessons about wildfires and wildfire complexity in southern California. First, the vast majority of large fires in southern California occur in the autumn under the influence of Santa Ana windstorms. These fires also cost the most to contain and cause the most damage to life and property, and the October 2007 fires were no exception because thousands of homes were lost and seven people were killed. Being pushed by wind gusts over 100 kph, young fuels presented little barrier to their spread as the 2007 fires reburned considerable portions of the area burned in the historic 2003 fire season. Adding to the size of these fires was the historic 2006 – 2007 drought that contributed to high dead fuel loads and long distance spotting. As in 2003, young chaparral stands and fuel treatments were not reliable barriers to fire in October 2007. Second, the Zaca Fire in July and August 2007 showed that other factors besides high winds can sometimes combine to create conditions for large fires in southern California. Spring and summer fires in southern California chaparral are usually easily contained because of higher fuel moisture and the general lack of high winds. However, the Zaca Fire burned in a remote wilderness area of rugged terrain that made access difficult. In addition, because of its remoteness, anthropogenic ignitions have been low and stand age and fuel loads were high. Coupled with this was severe drought that year that generated fuel moisture levels considerably below normal for early summer. A third lesson comes from 2007 conifer forest fires in the southern California mountains. In contrast to lower elevation chaparral, fire suppression has led to major increases in conifer forest fuels that can lead to unnaturally severe fires when ignitions escape control. The Slide and Grass Valley Fires of October 2007 occurred in forests that had been subject to extensive fuel treatment, but fire control was complicated by a patchwork of untreated private properties and mountain homes built of highly flammable materials. In a fashion reminiscent of other recent destructive conifer fires in California, burning homes themselves were a major source of fire spread.

These lessons suggest that the most important advances in fire safety mitigation in this region are to come from advances in fire prevention, fire preparedness, and land-use planning that includes fire hazard patterns.

Historical Profile: Table 3 summarizes the fires that have occurred in all these areas over the last 100 years.

Table 3: Wildfire Hazards

Date of Event	Type of Damage	Amount of Damage	Stateside or Local
July 1960	No deaths, 12 injuries	\$10 M, 74,000 acres, 33 homes destroyed.	Los Angeles, San Bernardino Counties
Fall 1970	19 deaths	Public-\$52.8 M; watershed-\$24.8 M; private - \$145.9 M; Total - \$223.6 M; 576, 508 acres, 722 buildings, San Bernardino County-53,100 acres, 54 buildings	Various
Dec 1970		\$3.2 M	Riverside
Nov 1980		Public-\$14 M; private-\$50.8 M; Total-\$64.8 M. San Bernardino County-65 buildings, 5482 acres destroyed. Additionally, 355 building, 41,472 acres destroyed.	Various
Aug 1987	3 deaths, 76 injuries	\$18 M (estimated); 1,070 fires. 534,661 acres burned, 835 square miles, 38 homes destroyed.	Various
June 1990	3 deaths, 89 injuries	\$300 M+; 22,500 blackened acres, 492 homes destroyed	Los Angeles, Santa Barbara, Riverside, San Bernardino Counties
Oct 1993	4 deaths, 162 injuries	Total property estimates-\$1 B; 1078 destroyed structures, 193,814 acres destroyed.	Los Angeles, Ventura, Riverside, San Bernardino, Orange, San Diego Counties
Oct/Nov 2003	22 deaths	\$218 M ++, 750,043 acres burned	Los Angeles, Ventura, Riverside, San Bernardino, San Diego Counties
Oct/Nov 2007		\$144 M ++, 522,000 acres burned	Los Angeles, Ventura, Orange, Riverside, San Bernardino, San Diego, Santa Barbara Counties

Summarizing Risk

- Probability
 - Impact:
- Likely Critical**

Rank	Natural Hazards	Probability (1-4)	Factor1 = (Probability Index * .30)	Impact (1-4)	Factor2 = (Impact Index * .30)	Spatial Extent (1-4)	Factor3 = (Spatial Extent Index * .20)	Warning Time (1-4)	Factor4 = (Warning Time Index * .10)	Duration (1-4)	Factor5 = (Probability Index * .10)	RF Factor Total = (Add Factors 1-5)
1	Wildfires	3	0.9	3	0.9	3	0.6	4	0.4	4	0.4	3.2

Please see Figure 1 and Figure 2

Figure 1: Fire Hazard Map

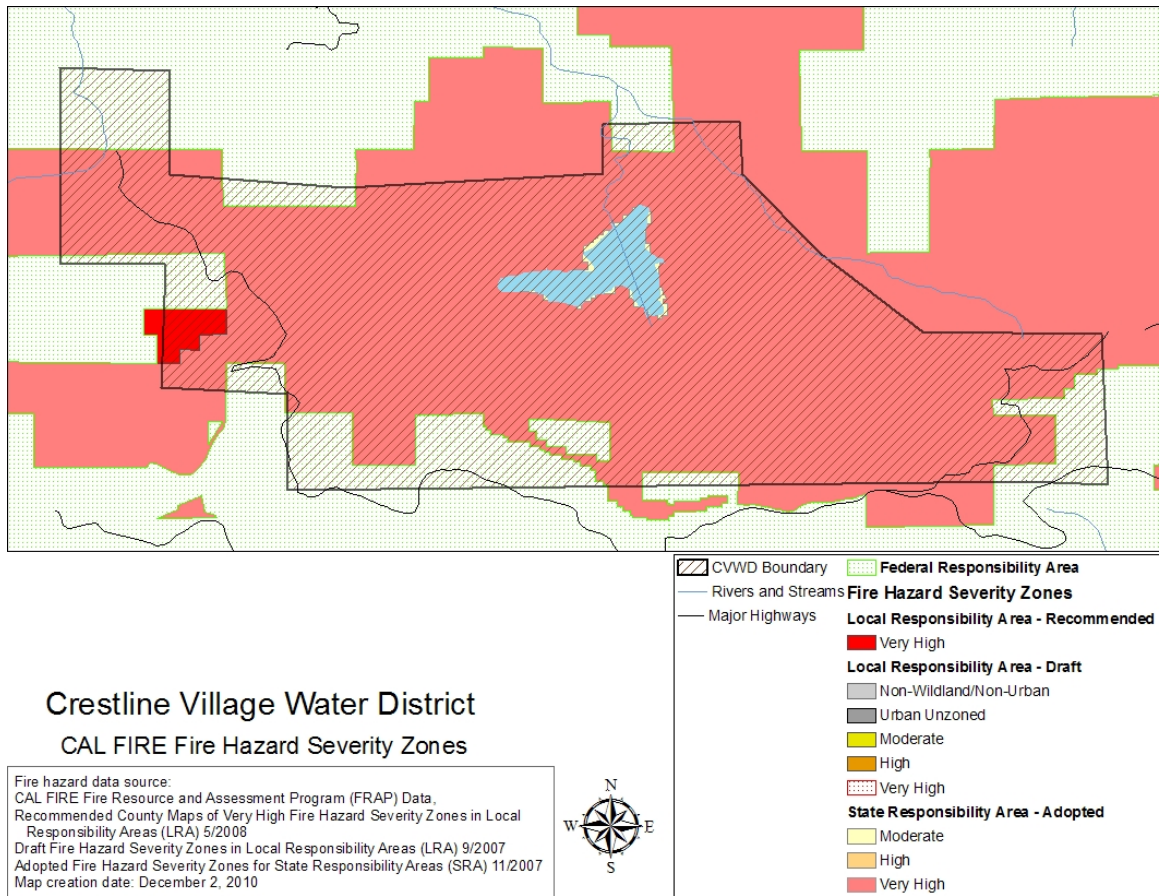
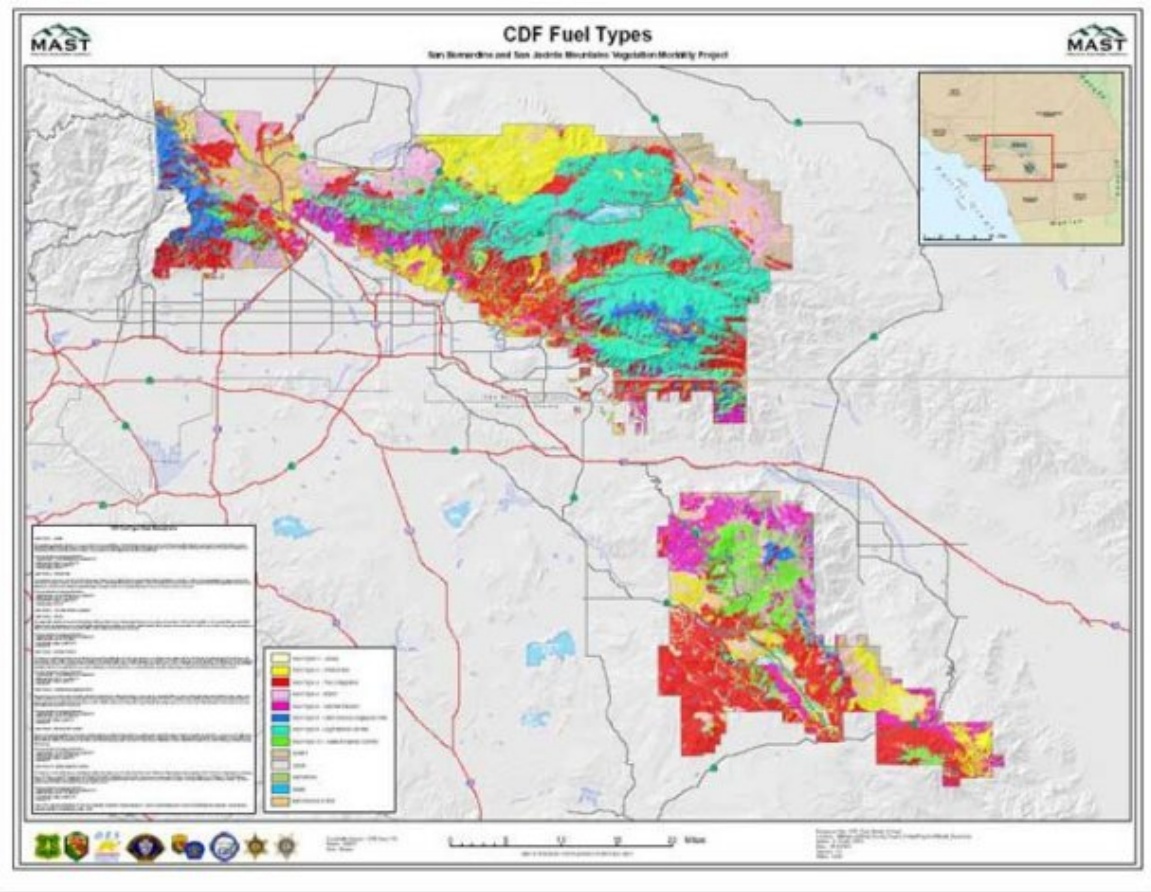


Figure 2: Fire Hazard Map



4.2.2 Earthquake Hazard

The following section describes the hazard and then details the historical events associated with this hazard for the Crestline Village Water District.

General Definition: An earthquake is a sudden, rapid shaking of the Earth caused by the breaking and shifting of rock beneath the Earth's surface. For hundreds of millions of years, the forces of plate tectonics have shaped the Earth as the huge plates that form the Earth's surface move slowly over, under, and past each other. Sometimes the movement is gradual. At other times, the plates are locked together, unable to release the accumulating energy. When the accumulated energy grows strong enough, the plates break free causing the ground to shake. Most earthquakes occur at the boundaries where the plates meet; however, some earthquakes occur in the middle of plates.

Ground shaking from earthquakes can collapse buildings and bridges; disrupt gas, electric, water utilities and phone service; and sometimes trigger landslides, avalanches, flash floods, fires, and huge, destructive ocean waves (tsunamis). Buildings with foundations resting on unconsolidated landfill and other unstable soil, and trailers and homes not tied to their foundations are at risk because they can be shaken off their mountings during an earthquake. When an earthquake occurs in a populated area, it may cause deaths and injuries and extensive property damage.

Earthquakes strike suddenly, without warning. Earthquakes can occur at any time of the year and at any time of the day or night. On a yearly basis, 70 to 75 damaging earthquakes occur throughout the world. Estimates of losses from a future earthquake in the United States approach \$200 billion.

There are 45 states and territories in the United States at moderate to very high risk from earthquakes, and they are located in every region of the country. California experiences the most frequent damaging earthquakes; however, Alaska experiences the greatest number of large earthquakes—most located in uninhabited areas. The largest earthquakes felt in the United States were along the New Madrid Fault in Missouri, where a three-month long series of quakes from 1811 to 1812 included three quakes larger than a magnitude of 8 on the Richter Scale. These earthquakes were felt over the entire Eastern United States, with Missouri, Tennessee, Kentucky, Indiana, Illinois, Ohio, Alabama, Arkansas, and Mississippi experiencing the strongest ground shaking.

Description: The area served by the Crestline Village Water District is in close proximity to several major earthquake faults. The San Andreas Fault runs across the foot of the San Bernardino Mountains near Highway 18, Arrowhead Springs Area, less than five miles from Crestline. Additional faults in the San Bernardino area, i.e. San Jacinto, are also within 10 miles of the District.

While there have been many earthquakes in and around the District's service area, none have caused damages to the District's facilities.

A source for the earthquake profile was a report that describes a new earthquake rupture forecast for California developed by the 2014 Working Group on California Earthquake Probabilities (WGCEP 2014). The Working Group was organized in September, 2005, by the U.S. Geological Survey (USGS), the California Geological Survey (CGS), and the Southern California Earthquake Center (SCEC). The group

produced a revised, time dependent and time independent forecast for California for the national seismic hazard maps.

Overall the results confirm previous findings, but with some significant changes because of model improvements. For example, compared to the previous forecast (Uniform California Earthquake Rupture Forecast 2), the likelihood of moderate-sized earthquakes (magnitude 6.5 to 7.5) is lower, whereas that of larger events is higher.

Appendix C.1 presents the earthquake profile findings for the District’s service area. The ground motion findings indicate the peak ground acceleration (PGA) within the District’s service area could potentially exceed 80 percent. Typically, any acceleration over 3 percent is considered excessive. Also, a map shown in

Appendix C.2 illustrates that there is a 97% probability that Southern California will have a 6.7 scale earthquake over the next 30 years.

Table 4 summarizes the occurrences, impact, and costs of this hazard.

Table 4: Earthquake History

Earthquake Name	Date of Earthquake	Magnitude of Quake	Damage Description
Wrightwood Earthquake	December 8, 1812	7.5	40 deaths.
Cajon Pass	July 22, 1899	5.7	Landslides, heavy damage to building in San Bernardino. No deaths.
San Jacinto	December 25, 1899	6.5	San Jacinto & Hemet had severe damage. Six deaths. Chimneys thrown down and walls cracked in Riverside.
Elsinore	May 15, 1910	6.0	Chimney’s toppled.
San Jacinto	April 21, 1918	6.8	Most damage in San Jacinto and Hemet. Several injuries, one death. Landslides, cracks in ground, roads, and canals.
North San Jacinto	July 22, 1923	6.3	Chimney’s toppled, broken windows, 2 critical injuries, no deaths, San Bernardino hospital and Hall of Records badly damaged.
San Jacinto Terwilliger	March 25, 1937	6.0	Few chimneys damaged, some plaster cracked, a few windows broken. Minimal damage mostly due to sparsely populated area.
Fish Creek Mountains	October 21, 1942	6.6	Little damage due to remote location, felt over a large area. Rockslides.
Desert Hot Springs	December 4, 1948	6.0	Widespread damage. In Los Angeles, 5,800 gallon water tank split, water pipes broken in Pasadena, at UCLA, and San Diego. Walls cracked in Escondido and Corona.
1954 San Jacinto	March 19 1954	6.4	Minor widespread damage. Parts of San Bernardino experienced a temporary blackout.
Borrego Mountain	April 8, 1968	6.5	Largest most damaging earthquake in 16 years. Damage across most of Southern

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			California. Landslides, huge boulders thrown.
Lytle Creek	September 12, 1970	5.2	Landslides, rock falls, 4 injuries, San Bernardino radio station knocked off the air.
White Wash	February 25, 1980	5.5	Landslides. Windows and dishes broken. Fire broke out in Rancho Mirage due to a gas line rupture in an empty home.
1988 Upland and 1990 Upland	June 26, 1988 and February 28, 1990	4.7 and 5.4 respectively	Landslides, damage to San Antonio Dam, 38 minor injuries. Public-\$4.87M; business-\$4.7M; private-\$2.4M; total-\$12M; 501 homes and 115 businesses damaged or destroyed.
North Palm Springs	July 8, 1986	5.6	29 injuries. Destruction or damage of 51 homes. Landslides. Damage over \$4M.
Joshua Tree	April 22, 1992	6.1	32 minor injuries.
Big Bear Landers	June 28, 1992	2 separate earthquakes Big Bear 6.4, Landers 7.3.	Landslides in San Bernardino Mountains. Substantial damage in Big Bear. Landers was the largest earthquake in southern California in 40 years. Earthquake ruptured 5 separate faults. Total rupture length was 53 miles. One death, 402 injuries. Private-\$47.5M; business-\$17M; public-\$26.6M; total \$91M; 77 homes destroyed, 4,369 homes damaged, 139 businesses damaged.
Hector Mine	October 16, 1999	7.1	Very remote location. Ruptured in both directions from the epicenter.

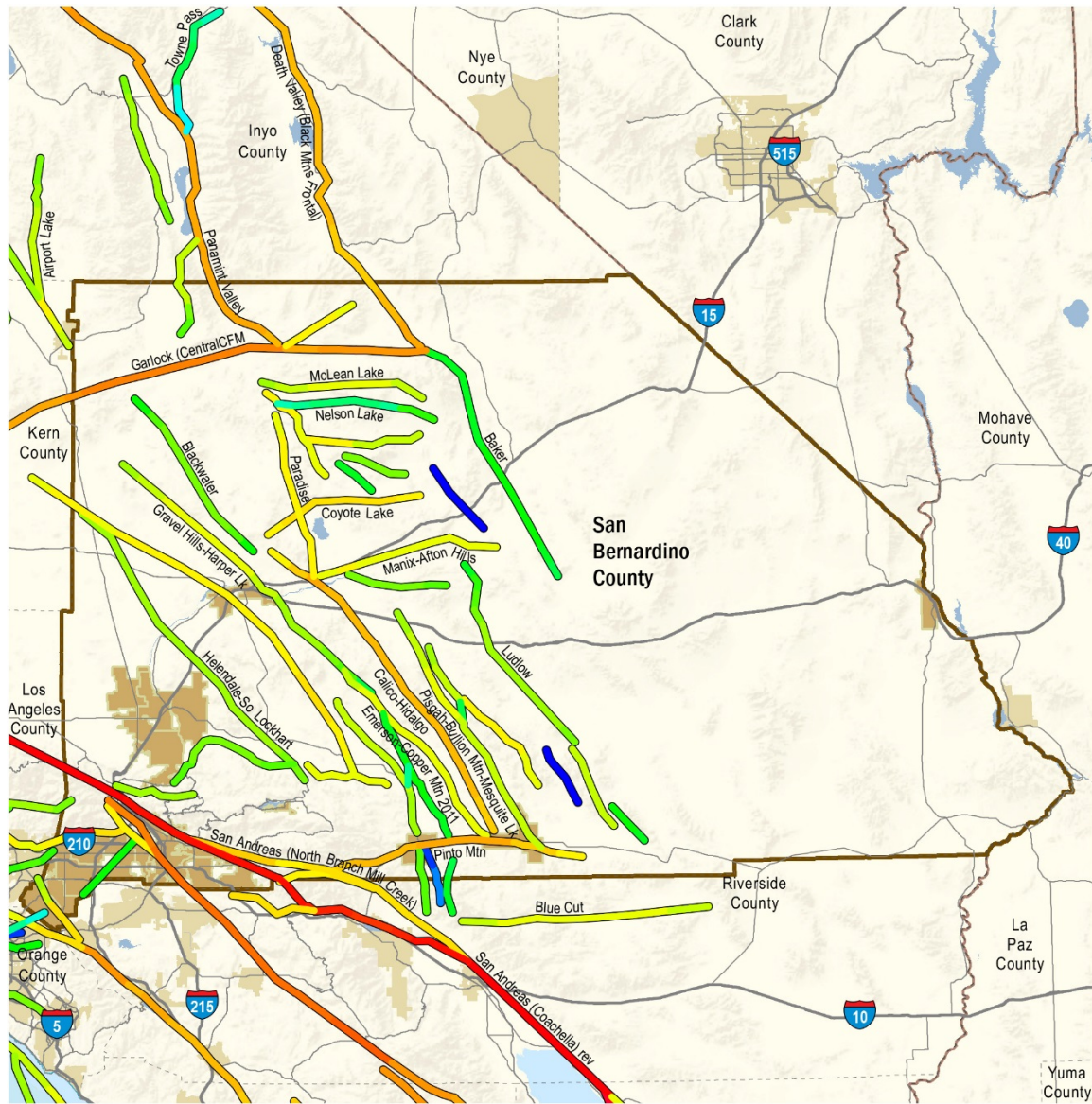
Summarizing Risk

- Probability
 - Impact:
- Likely
Critical**

Rank	Natural Hazards	Probability (1-4)	Factor1 = (Probability Index * .30)	Impact (1-4)	Factor2 = (Impact Index * .30)	Spatial Extent (1-4)	Factor3 = (Spatial Extent Index * .20)	Warning Time (1-4)	Factor4 = (Warning Time Index * .10)	Duration (1-4)	Factor5 = (Probability Index * .10)	RF Factor Total = (Add Factors 1-5)
2	Earthquake	3	0.9	3	0.9	3	0.6	4	0.4	1	0.1	2.9

Please see Figure 3

Figure 3: Earthquake Probability Map

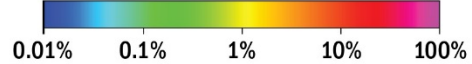


0 25 50 Miles

UCERF3 Fault Probabilities

NOTE: Fault Locations are uncertain by up to several km
www.wgcep.org/UCERF

30 Year M≥6.7 Probability



4.2.3 Drought Hazard

The following section describes the hazard and then details the historical events associated with this hazard for the Crestline Village Water District.

General Definition: A drought is a period of drier-than-normal conditions that results in water-related problems. Precipitation (rain or snow) falls in uneven patterns across the country. When no rain or only a small amount of rain falls, soils can dry out and plants can die. When rainfall is less than normal for several weeks, months, or years, the flow of streams and rivers declines, water levels in lakes and reservoirs fall, and the depth to water in wells increases. If dry weather persists and water supply problems develop, the dry period can become a drought. The first evidence of drought usually is seen in records of rainfall. Within a short period of time, the amount of moisture in soils can begin to decrease. The effects of a drought on flow in streams and rivers or on water levels in lakes and reservoirs may not be noticed for several weeks or months. Water levels in wells may not reflect a shortage of rainfall for a year or more after the drought begins. A period of below-normal rainfall does not necessarily result in drought conditions. Some areas of the United States are more likely to have droughts than other areas. In humid or wet regions, a drought of a few weeks is quickly reflected in a decrease in soil moisture and in declining flow in streams. In arid or dry regions, people rely on ground water and water in reservoirs to supply their needs. They are protected from short-term droughts, but may have severe problems during long dry periods because they may have no other water source if wells or reservoirs go dry.

Description: Because the District is in the business of selling water, drought can be a critical hazard to the District. A drought is defined as a series of years with less than average rainfall and typically lasts seven years.

The District is currently experiencing a drought that started in 2012. The 2013 California Water Plan states that Water Year 2013 was the driest year on record for the state.

Southern California has a history of severe droughts. There have been six severe extended droughts within the last 400 years (the most severe drought lasted from approximately 1650 to 1700). The U.S. Weather Service is forecasting 20 more years of below average rainfall.

The 2009 California Water Plan states that Water Year 2009 was the third consecutive dry year for the state. Because of losses caused by this drought, the U.S. Department of Agriculture in September designated all of the counties with the San Joaquin River, Tulare Lake, and Central Coast Hydrologic Regions as either Primary Natural Disaster Areas or Natural Disaster Areas (statewide total was 21 counties and 29 counties, respectively). The state entered the 2009-2010 Water Year with its key supply reservoirs at only 68 percent of average. On January 17, 2014 California State Governor, Jerry Brown, declared a drought state of emergency.

The fundamental drought impact to water purveyors is a reduction in available water supplies. As a result, historic occurrences of drought have encouraged water purveyors to review the reliability of their water supplies and to initiate planning programs addressing identified needs for improvement. In addition, public and media interest in droughts fosters heightened awareness of water supply reliability

issues in the Legislature. More than 50 drought-related legislative proposals were introduced during the severe, but brief 1976-77 drought. About one-third of these eventually became law. Similar activity on drought-related legislature proposals was observed during the 1987-92 drought. One of the most significant pieces of legislation was the 1991 amendment to the Urban Water Management and Planning Act, in effect since 1983 which requires water suppliers to estimate available water supplies at the end of one, two and three years, and to develop contingency plans for shortages of up to 50 percent. The District's 2015 Urban Water Management Plan (UWMP) (CVWD, 2016) presents water supply to demand comparisons through 2035. The 2015 UWMP was completed by July 16, 2016 and updated any demand and supplies documented in the 2011 UWMP and required all water purveyors to reduce their water demand by 20 percent by the year 2020. The plan also presents water supply to demand comparisons for single dry to multiple dry year scenarios. The comparisons show that the District has adequate supply through 2035.

If the current drought extends for the period that the U.S. Weather Service is currently forecasting, Crestline and the large stands of trees in and around Crestline will be dramatically impacted, resulting in periods of reduced availability of local ground water supplies and increased dependence on imported water. As the result of drought conditions, the District has to rely more on imported water. Imported water cost \$778 per acre foot more than well water.

Table 5 summarizes the occurrences, impact, and costs of this hazard.

Table 5: Drought History

Date of Event	Type of Damage	Amount of Damage	Statewide or Local
1976–1977	Annual statewide runoff dropped 21% below average.	1976–\$888.5M; 1977–\$1.775M; TOTAL–\$2.7B	Various
1987–1992	Annual statewide runoff dropped 27% below average. Twenty-three counties had declared local drought emergencies by the end of 1991.	SWP terminated services to agricultural contractors and provided only 10% of requested urban deliveries. Appropriate \$34.8M from the General Fund to the Dept for financial assistance to local water suppliers for emergency drought-relief water supply, technical water conservation assistance, and operation of the Dept’s Drought Information Center.	Statewide
1998–2002	San Bernardino National Forest – dead and dying trees, bark beetle infestations.	\$12,100 crop damage	Various
2007–2009	The drought of 2007–2009 saw greatly reduced water diversions from the state water project. During the drought years, statewide runoff was 53% of average in 2007 and 65% of average in 2009, compared to 173% of average in the wet water year of 2006 (DWR 2010). The summer of 2007 saw some of the worst wildfires in Southern California history.	The 12th worst drought period in the state’s history, and the first drought for which a statewide proclamation of emergency was issued. For economic loss, please view the California’s Drought of 2007–2009 Guide online at: www.water.ca.gov/waterconditions/docs/DroughtReport2010.pdf	Statewide
2011–2017	Many millions of California trees died from the drought – approximately 102 million, including 62 million in 2016 alone. By the end of 2016, 30% of California had emerged from the drought, mainly in the northern half of the state, while 40% of the state remained in the extreme or exceptional drought levels.	Economic impact is still being determined.	Statewide

Summarizing Risk

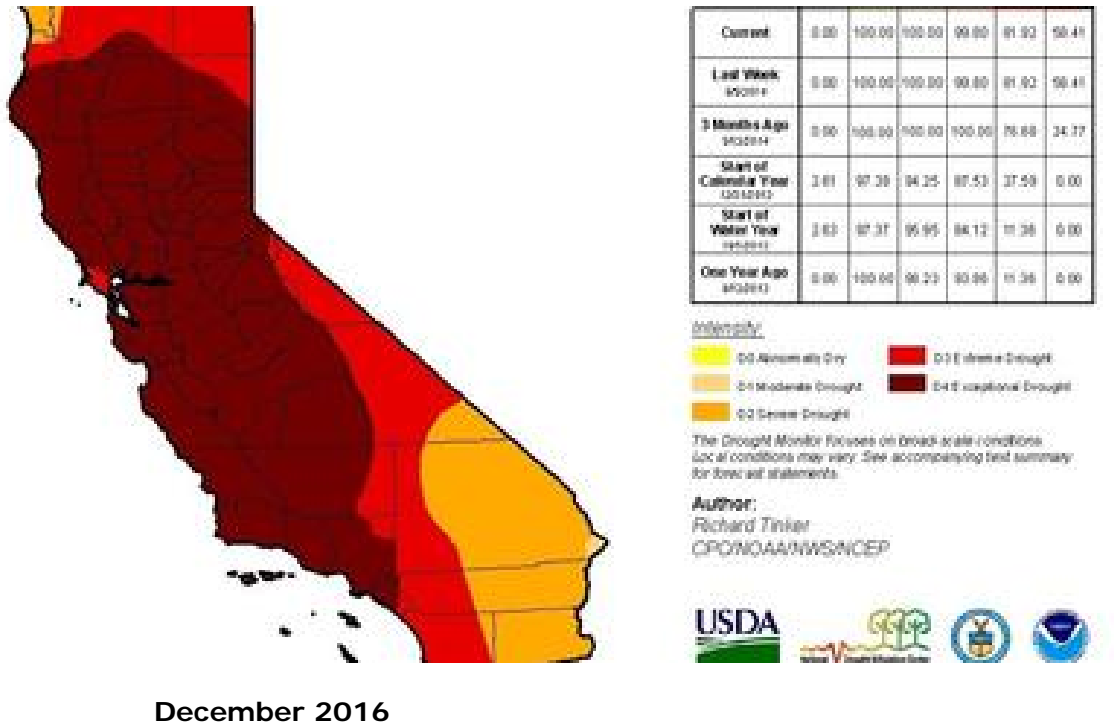
- Probability: **Likely**
- Impact: **Limited**

Rank	Natural Hazards	Probability (1-4)	Factor1 = (Probability Index *.30)	Impact (1-4)	Factor2 = (Impact Index *.30)	Spatial Extent (1-4)	Factor3 = (Spatial Extent Index *.20)	Warning Time (1-4)	Factor4 = (Warning Time Index *.10)	Duration (1-4)	Factor5 = (Probability Index *.10)	RF Factor Total = (Add Factors 1-5)
3	Drought	3	0.9	2	0.6	4	0.8	1	0.1	4	0.4	2.8

Please see: Please see Figure 4

- Appendix B: [Sources of Supply](#)
- File Description: Data and graphs of sources of supply records from 1989 to 2016

Figure 4: Drought Hazard Map



December 2016

4.2.4 Infestation Hazard

The following section describes the hazard and then details the historical events associated with this hazard for the Crestline Village Water District.

General Definition: Damage and destruction caused by infestation of a natural organism. This hazard can include problems caused by insects, virus, or any identifiable living organism. This hazard can be related to or caused by other natural hazards and may have residual effects beyond the issues directly related to the infestation.

Description: More than a million trees, weakened by years of drought in mountainous regions of San Bernardino, Riverside and San Diego counties, are dead or dying due to widespread infestation by an insect called the bark beetle.

In response, a California executive order declared a state of emergency on March 7, 2003. On April 3, 2003, California regulators ordered Southern California Edison and other utilities to remove trees threatening their power lines in affected areas.

Historical Profile: Bark Beetles have been around for many decades in the San Bernardino Mountains. The bark beetle outbreak was first observed in the southwestern portions of the forest, near the communities of Crestline, Lake Gregory, and Lake Arrowhead. The beetles have rapidly spread eastward into the communities of Running Springs, Big Bear Lake and beyond. The pines of the southwest regions of the forest have been more heavily harmed by ozone pollution and are therefore more susceptible to bark beetle attack. It is reasonable to speculate that the beetle outbreak started in the southwestern areas of the forest because of the increased stress of pollution in addition to the other stresses present throughout the forest. The tree mortality due to their attacks has been moderate in the past. The percent of trees infected has gone up and down based on drought and construction over the years. Overstocking of trees per acre has contributed to the tree weakness, making them vulnerable. Years of fire prevention and tree cutting regulations have led to this overstocking situation. Future thinning is needed to maintain a healthy forest and prevent tree mortality and major fires.

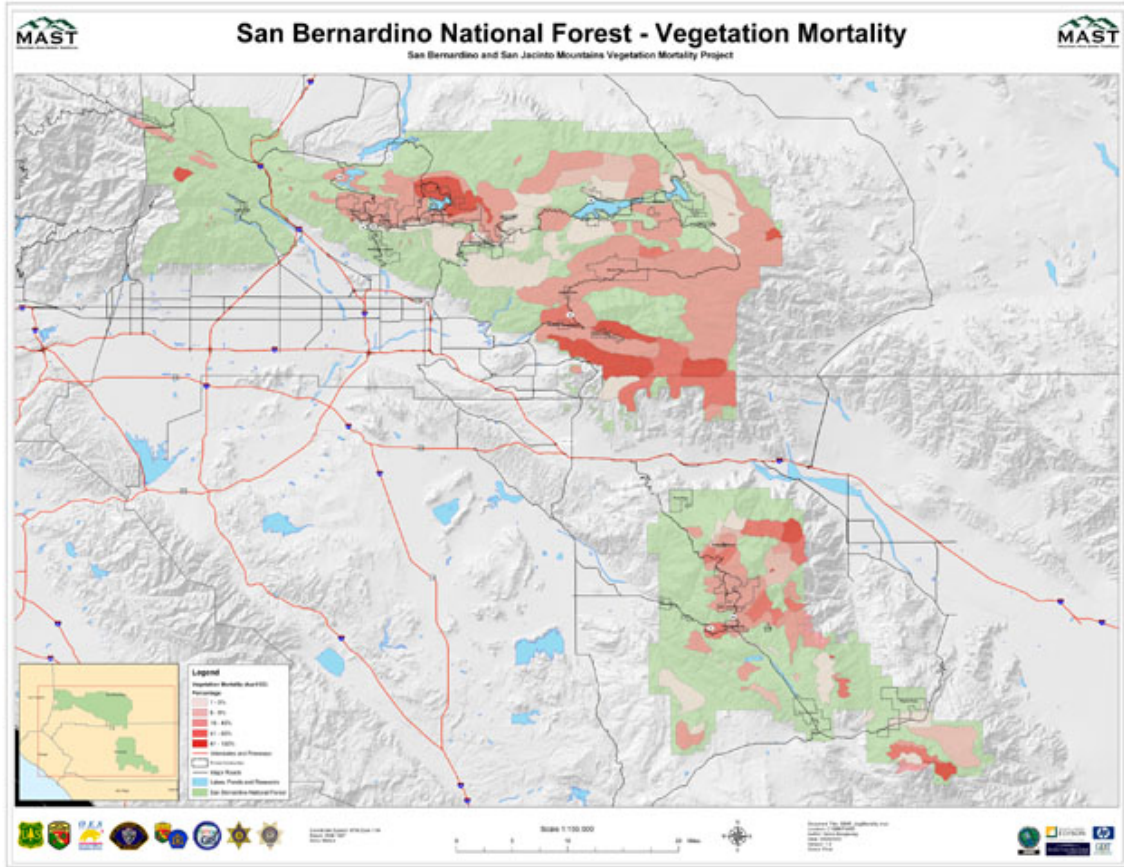
Summarizing Risk

- Probability **Likely**
- Impact: **Limited**

Rank	Natural Hazards	Probability (1-4)	Factor1 = (Probability Index * .30)	Impact (1-4)	Factor2 = (Impact Index * .30)	Spatial Extent (1-4)	Factor3 = (Spatial Extent Index * .20)	Warning Time (1-4)	Factor4 = (Warning Time Index * .10)	Duration (1-4)	Factor5 = (Probability Index * .10)	RF Factor Total = (Add Factors 1-5)
4	Infestation	3	0.9	2	0.6	3	0.6	1	0.1	4	0.4	2.6

Please see Figure 5

Figure 5: Infestation Hazard Map



4.2.5 Climate Change

The following Section describes the hazard and then details the historical events associated with this hazard for the Crestline Village Water District.

Climate change refers to any distinct change in measures of climate lasting for a long period of time, more specifically major changes in temperature, rainfall, snow, or wind patterns. Climate change may be limited to a specific region, or may occur across the whole Earth. Climate change may result from:

- Natural factors (e.g., changes in the Sun’s energy or slow changes in the Earth’s orbit around the Sun);
- Natural processes within the climate system (e.g., changes in ocean circulation); and
- Human activities that change the atmosphere’s make-up (e.g., burning fossil fuels) and the land surface (e.g., cutting down forests, planting trees, building developments in cities and suburbs, etc).

The effects of climate change are varied: warmer and more varied weather patterns, melting ice caps, and poor air quality, for example. As a result, climate change impacts a number of natural hazards.

The 2013 State of California Multi-Hazard Mitigation Plan stated that climate change is already affecting California. Sea levels have risen by as much as seven inches along the California coast over the last century, increasing erosion and pressure on the state’s infrastructure, water supplies, and natural resources. The State has also seen increased average temperatures, more extreme hot days, fewer cold nights, a lengthening of the growing season, shifts in the water cycle with less winter precipitation falling as snow, and both snowmelt and rainwater running off sooner in the year. In addition to changes in average temperatures, sea level, and precipitation patterns, the intensity of extreme weather events is also changing.

Climate change has never been directly responsible for any declared disasters. Past flooding, wildfire, levee failure, and drought disasters may have been exacerbated by climate change, but it is impossible to make direct connections to individual disasters. In addition, unlike earthquake and floods that occur over a finite time period, climate change is an on-going hazard, the effects of which some are already experiencing. Other effects may not be seriously experienced for decades, or may be avoided altogether by mitigation actions taken today.

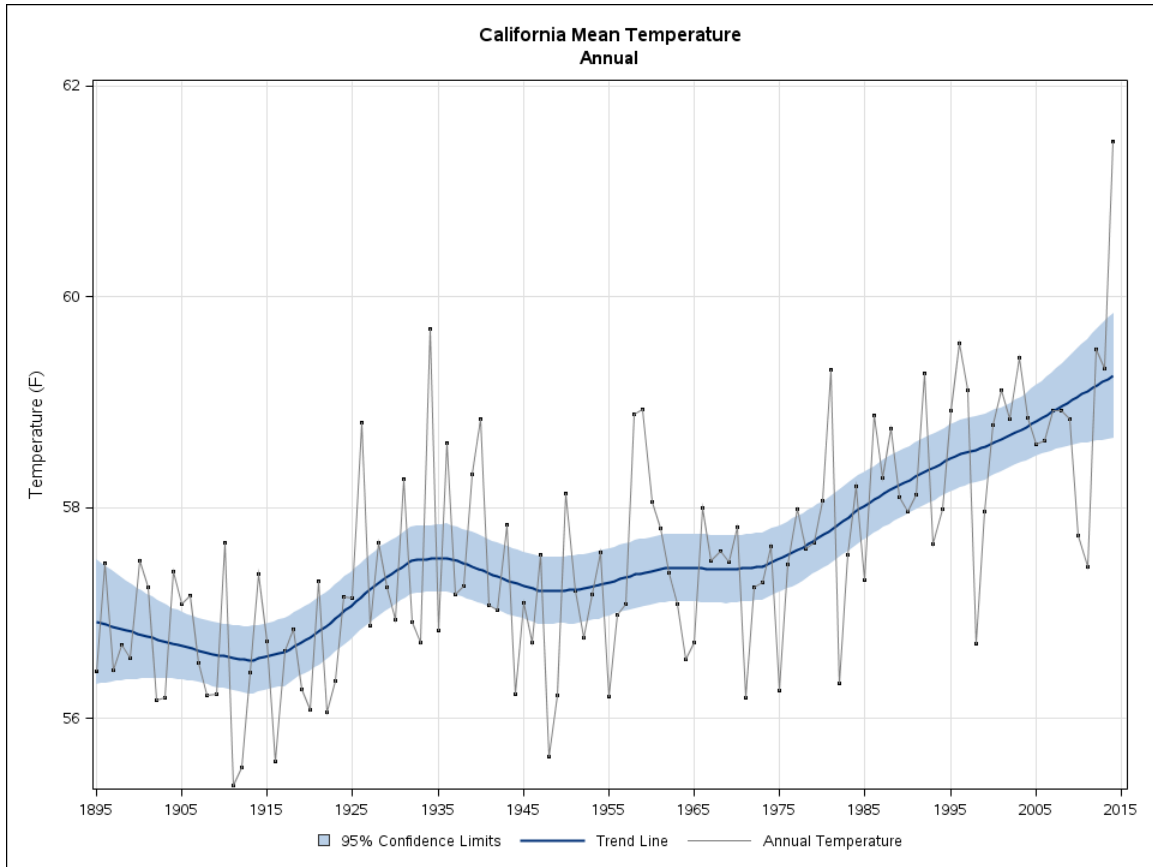
Summarizing Risk

- Probability: **Possible**
- Impact: **Limited**

Rank	Natural Hazards	Probability (1-4)	Factor1 = (Probability Index * .30)	Impact (1-4)	Factor2 = (Impact Index * .30)	Spatial Extent (1-4)	Factor3 = (Spatial Extent Index * .20)	Warning Time (1-4)	Factor4 = (Warning Time Index * .10)	Duration (1-4)	Factor5 = (Probability Index * .10)	RF Factor Total = (Add Factors 1-5)
5	Climate Change	2	0.6	2	0.6	4	0.8	1	0.1	4	0.4	2.5

Please see Figure 6

Figure 6: Climate Change Trend



4.2.6 Terrorism

The following Section describes the hazard and then details the historical events associated with this hazard for the Crestline Village Water District.

There is no single, universally accepted definition of terrorism, however, FEMA defines “terrorism” as intentional, criminal, malicious acts. FEMA document 386-7 refers to terrorism specifically as the use of Weapons of Mass Destruction (WMD), including biological, chemical, nuclear, and radiological weapons; arson, incendiary, explosive, and armed attacks; industrial sabotage and intentional hazardous materials releases; and “cyberterrorism.”

FEMA developed the Integrated Emergency Management System (IEMS) using an all-hazards approach. While the IEMS was established as an “all-hazard” approach, responding to the threat of terrorism (referred to as counterterrorism) came to be viewed as the responsibility of law enforcement, defense, and intelligence agencies. Furthermore, defensive efforts to protect people and facilities from terrorism (referred to as **antiterrorism**) were generally limited to the government sector, the military, and some industrial interests.

While the term “mitigation” refers generally to activities that reduce loss of life and property by eliminating or reducing the effects of disasters, in the terrorism context it is often interpreted to include a wide variety of preparedness and response actions. For the purposes of this document, the traditional meaning will be assumed; that mitigation refers to specific actions that can be taken to reduce loss of life and property from manmade hazards by “**modifying the built environment**” or antiterrorism to reduce the risk and potential consequences of these hazards.

After the Waterman Terrorism Incident on December 2nd, 2015 two full time positions with a regional FBI-led terrorist task force (FBI’s Joint Terrorism Task Force) were created. These task force officers have the clearance to conduct terrorism investigations in the County. The Task Force includes partners from Homeland Security Investigations (HSI), the San Bernardino Police Department, the San Bernardino County Sheriff’s Department, the Riverside County Sheriff’s Department, the Ontario Police Department, the Riverside Police Department, the Corona Police Department and the Chino Police Department.

Because the District’s exact location of facilities is extremely sensitive, specific terrorism acts and District vulnerability will not be included in this report.

Summarizing Risk

- Probability
 - Impact:
- Possible
Limited**

Rank	Natural Hazards	Probability (1-4)	Factor1 = (Probability Index * .30)	Impact (1-4)	Factor2 = (Impact Index * .30)	Spatial Extent (1-4)	Factor3 = (Spatial Extent Index * .20)	Warning Time (1-4)	Factor4 = (Warning Time Index * .10)	Duration (1-4)	Factor5 = (Probability Index * .10)	RF Factor Total = (Add Factors 1-5)
6	Terrorism	1	0.3	3	0.9	2	0.4	4	0.4	1	0.1	2.1

4.2.7 Winter Storms

The following Section describes the hazard and then details the historical events associated with this hazard for the Crestline Village Water District.

General Definition: A winter storm can range from moderate snow over a few hours to blizzard conditions with high winds, freezing rain or sleet, heavy snowfall with blinding wind-driven snow and extremely cold temperatures that lasts several days. Some winter storms may be large enough to affect several states while others may affect only a single community. All winter storms are accompanied by cold temperatures and blowing snow, which can severely reduce visibility. A severe winter storm is one that drops 4 or more inches of snow during a 12-hour period, or 6 or more inches during a 24-hour span. An ice storm occurs when freezing rain falls from clouds and freezes immediately on impact. All winter storms make driving and walking extremely hazardous. The aftermath of a winter storm can impact a community or region for days, weeks, and even months. Storm effects such as extreme cold, flooding, and snow accumulation can cause hazardous conditions and hidden problems for people in the affected area. People can become stranded on the road or trapped at home, without utilities or other services. Residents, travelers and livestock may become isolated or stranded without adequate food, water and fuel supplies. The conditions may overwhelm the capabilities of a local jurisdiction. Winter storms are considered deceptive killers as they indirectly cause transportation accidents, and injury and death resulting from exhaustion/overexertion, hypothermia and frostbite from wind chill, and asphyxiation; house fires occur more frequently in the winter due to lack of proper safety precautions.

"Wind chill" is a calculation of how cold it feels outside when the effects of temperature and wind speed are combined. On November 1, 2001, the National Weather Service (NWS) implemented a replacement Wind Chill Temperature (WCT) index for the 2001/2002 winter season. The reason for the change was to improve upon the current WCT Index, which was based on the 1945 Siple and Passel Index. A winter storm watch indicates that severe winter weather may affect your area. A winter storm warning indicates that severe winter weather conditions are definitely on the way. A blizzard warning means that large amounts of falling or blowing snow and sustained winds of at least 35 miles per hour are expected for several hours.

Description: Crestline Village Water District receives an average of about 60 inches of snowfall each year. During the winter months, nighttime temperatures fall into the high 20's F and low 30's F. During severe storms, temperatures can reach the teens. Extremely low temperatures can cause freezing on the water mains and customer service lines.

Historical Profile: The highest recorded one day snowfall is 36.0 inches, the most recent event of this amount was in March 1991.

Summarizing Risk

- Probability
 - Impact:
- Likely Limited**

Rank	Natural Hazards	Probability (1-4)	Factor1 = (Probability Index * .30)	Impact (1-4)	Factor2 = (Impact Index * .30)	Spatial Extent (1-4)	Factor3 = (Spatial Extent Index * .20)	Warning Time (1-4)	Factor4 = (Warning Time Index * .10)	Duration (1-4)	Factor5 = (Probability Index * .10)	RF Factor Total = (Add Factors 1-5)
7	Winter Storms	2	0.6	1	0.3	4	0.8	1	0.1	3	0.3	2.1

4.2.8 Flooding Hazard

The following section describes the hazard and then details the historical events associated with this hazard for the Crestline Village Water District.

General Definition: A flood, as defined by the National Flood Insurance Program is: “A general and temporary condition of partial or complete inundation of two or more acres of normally dry land area or of two or more properties (at least one of which is your property) from:

- Overflow of inland or tidal waters.
- Unusual and rapid accumulation or runoff of surface waters from any source, or a mudflow.

The collapse or subsidence of land along the shore of a lake or similar body of water as a result of erosion or undermining caused by waves or currents of water exceeding anticipated cyclical levels that result in a flood.”

Floods can be slow or fast rising but generally develop over a period of days. Mitigation includes any activities that prevent an emergency, reduce the chance of an emergency happening, or lessen the damaging effects of unavoidable emergencies. Flooding tends to occur in the summer and early fall because of the monsoon and is typified by increased humidity and high summer temperatures. The standard for flooding is the so-called “100-year flood,” a benchmark used by the Federal Emergency Management Agency to establish a standard of flood control in communities throughout the country. Thus, the 100-year flood is also referred to as the “regulatory” or “base” flood. Actually, there is little difference between a 100-year flood and what is known as the 10-year flood. Both terms are really statements of probability that scientists and engineers use to describe how one flood compares to others that are likely to occur. In fact, the 500-year flood and the 10-year flood are only a foot apart on flood elevation-which means that the elevation of the 100-year flood falls somewhere in between. The term 100-year flood is often incorrectly used and can be misleading. It does not mean that only one flood of that size will occur every 100 years. What it actually means is that there is a one percent chance of a flood of that intensity and elevation happening in any given year. In other words, it is the flood elevation that has a one percent chance of being equaled or exceeded each year. And it could occur more than once in a relatively short period of time. (By comparison, the 10-year flood means that there is a ten percent chance for a flood of its intensity and elevation to happen in any given year.)

See Figure 7 at the end of this section for details. The map shows the flood hazard within the District's service area prepared using the Federal Emergency Management Agency (FEMA) National Flood Hazard Layer (NFHL) maps. The NFHL is a computer database that contains the flood hazard map information from FEMA's Flood Map Modernization program. These map data are from Digital Flood Insurance Rate Map (DFIRM) databases and Letters of Map Revision (LOMRs). The maps use computed or estimated water surface elevations combined with topographic mapping data to represent the flood hazard. The 100-year flood represents a compromise between minor floods and the greatest flood likely to occur in a given area. In most cases the 100-year flood is less than the flood of record and has been widely adopted as the common design and regulatory standard in the US. It was formally established as a standard for use by Federal agencies in 1977 and later confirmed by FEMA in 1982.

Description: Due to the elevation of Crestline Village Water District's service area the District is most likely to suffer from flooding due to unusual and rapid accumulation or runoff of surface waters from any source, or a mudflow. Runoff is escalated by the occurrence of wildfires. The flood of 2003 caused damage to District facilities. Roads were washed out and water mains undermined. Many water mains became exposed and ruptured. Access to the mountain communities was limited due to road closures.

Please note that the District is not a member of the National Flood Insurance Program (NFIP) and fortunate to not have any identified Repetitive and Severe Repetitive Loss Properties.

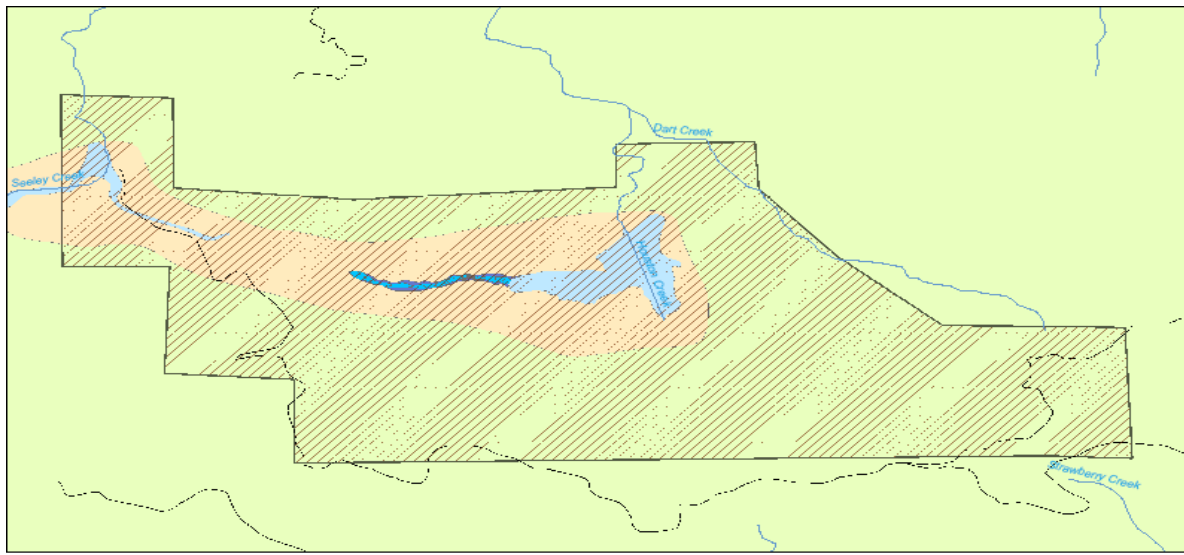
Summarizing Risk

- Probability
 - Impact:
- Possible Limited**

Rank	Natural Hazards	Probability (1-4)	Factor1 = (Probability Index * .30)	Impact (1-4)	Factor2 = (Impact Index * .30)	Spatial Extent (1-4)	Factor3 = (Spatial Extent Index * .20)	Warning Time (1-4)	Factor4 = (Warning Time Index * .10)	Duration (1-4)	Factor5 = (Probability Index * .10)	RF Factor Total = (Add Factors 1-5)
8	Flooding	2	0.6	2	0.6	2	0.4	2	0.2	1	0.1	1.9

Please see Figure 7

Figure 7: Flood Hazard Map



**Crestline Village
Water District
FEMA Flood Hazard Areas**



Flood data source:
FEMA's National Flood Hazard Layer, April 10, 2010
Map creation date: December 2, 2010

	CVWD Boundary	Special Flood Hazard Areas
	Rivers and Streams Subject to Inundation by the 1% Annual Chance Flood	
	Major Highways	
	Zone A (No Base Flood Elevations (BFEs) Determined)	
	Zone AE (BFEs Determined)	
	Zone AH (Flood Depths of 1 to 3 feet, usually areas of ponding; BFEs Determined)	
	Zone AO (Flood Depths of 1 to 3 feet, usually sheet flow on sloping terrain; Avg. depths determined)	
	Other Flood Areas	
	Zone X (Shaded) - 0.2% Annual chance (500yr) Flood	
	Zone X Protected by Levee - areas protected from the 1% annual chance flood	
	Other Areas	
	Zone D - areas in which flood hazards are undetermined, but possible	
	Zone X (unshaded) - areas determined to be outside the 0.2% annual chance (500-year) floodplain	

4.2.9 Dam Inundation Description

The following Section describes the hazard and then details the historical events associated with this hazard for the Crestline Village Water District

General Definition: Dam failure Inundation is defined as the flooding which occurs as the result of structural failure of a dam. Structural failure may be caused by seismic activity. Seismic activity may also cause inundation by the action of a seismically-induced wave which overtops the dam without also causing dam failure. This action is referred to as a seiche. Water retained in a dam could also be displaced by the action of a volcanically-induced mudflow. Landslides flowing into a reservoir are also a source of potential dam failure or overtopping. Structurally defective dams can be a cause for dam failure.

Description: In reviewing the County of San Bernardino’s “General Plan Dam Inundation Areas”, developed by San Bernardino County Land Use Services, it appears that the Crestline Village Water District service area falls within a dam inundation area. The area is small and sparsely populated. The District will continue to monitor this area annually, but expects limited to no impact. Also, the District has no history of dam inundation.

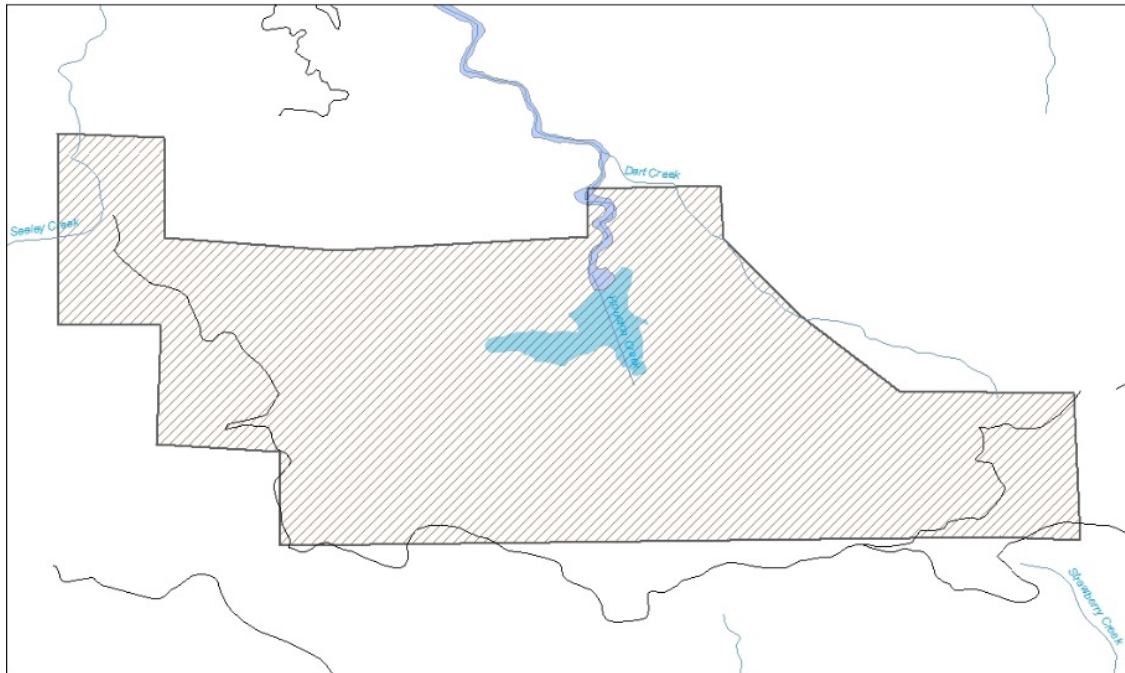
Summarizing Risk

- Probability: **Unlikely**
- Impact: **Limited**

Rank	Natural Hazards	Probability (1-4)	Factor1 = (Probability Index * .30)	Impact (1-4)	Factor2 = (Impact Index * .30)	Spatial Extent (1-4)	Factor3 = (Spatial Extent Index * .20)	Warning Time (1-4)	Factor4 = (Warning Time Index * .10)	Duration (1-4)	Factor5 = (Probability Index * .10)	RF Factor Total = (Add Factors 1-5)
9	Dam Inundation	1	0.3	2	0.6	1	0.2	2	0.2	1	0.1	1.4

Please see Figure 8






Figure 8: Dam Inundation Map



**Crestline Village Water District
Dam Inundation Areas**

Dam Inundation data source:
General Plan Dam Inundation Areas, developed by San Bernardino County Land Use Services,
provided by San Bernardino County ISD-GIS
Map creation date: December 2, 2010



-  CVWD Boundary
-  Rivers and Streams
-  Major Highways
-  Dam Inundation Areas
-  Water Features

4.2.10 Hazard Summary

Using the hazard screening criteria and assessment matrix discussed in the previous two sections, the District’s planning team experience of 68 plus years, the following four hazards were determined to be the most likely to affect the District:

1. Wildfires: The District is surrounded by the San Bernardino National Forest. Wildfires could potentially damage 100% of the District’s critical facilities.
2. Earthquake Hazard: There are two active faults within miles of the District’s service area. These faults could potentially damage 100% of the District’s critical facilities.
3. Drought: A drought could impact 100% of the District’s population because water is the business of the District. If there is no water to sell, the District receives no revenue.
4. Infestation: The District is surrounded by the San Bernardino National Forest. Infestation could impact 100% of the District’s population because of Bark Beetles.

Table 6: CVWD’s Hazard Assessment Matrix

Rank	Natural Hazards	Probability (1-4)	Factor1 = (Probability Index * .30)	Impact (1-4)	Factor2 = (Impact Index * .30)	Spatial Extent (1-4)	Factor3 = (Spatial Extent Index * .20)	Warning Time (1-4)	Factor4 = (Warning Time Index * .10)	Duration (1-4)	Factor5 = (Probability Index * .10)	RF Factor Total = (Add Factors 1-5)
1	Wildfires	3	0.9	3	0.9	3	0.6	4	0.4	4	0.4	3.2
2	Earthquake	3	0.9	3	0.9	3	0.6	4	0.4	1	0.1	2.9
3	Drought	3	0.9	2	0.6	4	0.8	1	0.1	4	0.4	2.8
4	Infestation	3	0.9	2	0.6	3	0.6	1	0.1	4	0.4	2.6
5	Climate Change	2	0.6	2	0.6	4	0.8	1	0.1	4	0.4	2.5
6	Terrorism	2	0.6	3	0.9	2	0.4	4	0.4	1	0.1	2.4
7	Winter Storms	2	0.6	1	0.3	4	0.8	1	0.1	3	0.3	2.1
8	Flooding	2	0.6	2	0.6	2	0.4	2	0.2	1	0.1	1.9
9	Dam Inundation	1	0.3	2	0.6	1	0.2	2	0.2	1	0.1	1.4

4.3 Inventory Assets

This section provides an overview of the assets in the Crestline Village Water District and the hazards to which these facilities are susceptible.

4.3.1 Population

The total Population of Crestline Village Water District that is vulnerable is approximately 13,200.

4.3.2 Buildings

As of 2016, the District operates and maintains the following facilities:

- 11 pressure zones,
- 14 water storage tanks of various sizes that has a total storage capacity of 8.7 million gallons (MG),
- 26 horizontal and vertical wells,
- 15 pump stations,
- Norman L. Hunt Administrative and Maintenance Facility which includes 9,000 square feet facility that houses the District's Administrative offices and its maintenance garage,
- Approximately 72.8 miles of distribution and transmission facilities (sizes 2 inch to 12 inch).

The District's water system is one contiguous area with 11 pressure zones running basically east to west.

4.3.3 Critical Facility List

This section provides a listing of the critical facilities in Crestline Village Water District. The primary contact for all the District Facilities is the following:

Primary Contact: Karl B. Drew
777 Cottonwood Drive
Crestline, CA 92325-3347
Phone: 909-338-1727
Fax: 909-338-4080
E-mail: kbdrew@cvwater.com

Because the District's exact location of facilities is extremely sensitive, especially due to increased concerns for national security, only general locations have been included in this section.

Crestline Village Water District has 14 above ground water storage tanks, 26 wells, approximately 73 miles of water distribution mains and appurtenances, and the Norman L. Hunt Administrative and Maintenance Facility that are considered critical to its ability to complete its mission.

To minimize any hazard mitigation potential from the District's newly constructed facilities, all future reservoirs will be constructed adequately for existing seismic conditions, which includes a swivel joint for the inlet/outlet to allow movement and anchoring the tank down with bolts similar to a large concrete footing. In addition, all buildings will meet the current seismic building codes.

Semi-annually all tank sites and District property is cleared of brush, hanging branches and limbs. Dead or dying trees are removed from the property.

4.4 Vulnerability Assessment

4.4.1 Methodology

The facility replacement costs were calculated using the District's account and insurance replacement values. The annual economic impacts were estimated by ranking the facilities by their importance to the District's production of water and using this ranking to develop a percentage of importance for each facility. This percentage was applied to the projected 2015/2016 annual water revenue from the District to obtain the annual economic impact for each facility.

4.4.2 Wildfires Vulnerability Analysis

Population: Approximately 55 percent of the community's population is vulnerable.

Critical Facilities: Approximately 25 percent of the District's facilities are vulnerable.

The specific critical facilities vulnerable in Crestline Village Water District are:

1. All tanks and pump houses within the District boundaries with Beacon I and II and Pinecrest tanks being the most critical.
2. The Norman L. Hunt Administrative and Maintenance Facility.

4.4.3 Earthquake Vulnerability Analysis

Population: Approximately 92 percent of the community's population is vulnerable.

Critical Facilities: Approximately 100 percent of the community's critical facilities are vulnerable.

There are two faults that affect the District facilities. All District facilities are at risk if a severe earthquake occurred.

The specific critical facilities vulnerable in Crestline Village Water District are:

The projected 2015/2016 annual water revenue from the District \$2.3M is used to estimate the lost annual revenue.

1. The District has 6 months of lost revenue from the earthquake.

2. All the District's critical facilities are at risk, including 30 percent of the District's pipelines.
3. Without critical facilities no revenue can be generated for the District.

4.4.4 Drought Vulnerability Analysis

Population: Approximately 100 percent of the District's population is vulnerable.

Critical Facilities: Approximately 50 percent of the District's critical facilities are vulnerable.

The specific critical facilities vulnerable in Crestline Village Water District are:

All wells and tanks are critical to drought because they supply the water for the District. During a drought, the levels in the wells become lower and therefore more pumping is required (increasing the pumping costs) and many wells are not able to produce as much water during the peak demands. Also, more water must be purchased from the state water project.

Pipelines are NOT critical in a drought.

Estimated Losses: The economic loss resulting from this hazard is approximately \$804,000. The loss of damage to structures from this hazard is approximately \$0.

The Crestline Village Water District Board of Directors adopted Ordinance No. 35 on August 19, 2014, which outlines a seven-phase "Water Use Reduction Program" for the District. For the purpose of conforming to the Drought Emergency Water Conservation regulations imposed by the SWRCB, the CVWD Board of Directors adopted Resolution No. 421 to amend the District's Water Conservation Program (Ordinance No. 35) effective May 10, 2015.

4.4.5 Infestation Analysis

Population: Approximately 0 percent of the community's population is vulnerable.

Critical Facilities: Approximately 25 percent of the community's critical facilities are vulnerable.

The specific critical facilities vulnerable in Crestline Village Water District are: Water Storage Tanks and Pump Houses.

Water storage tanks and pump house sites are cleared semi-annually of dead and dying trees caused by infestation.

4.4.6 Climate Change Analysis

Population: Approximately 100 percent of the community's population is vulnerable.

Critical Facilities: Approximately 10 percent of the community's critical facilities are vulnerable.

The specific critical facilities vulnerable in Crestline Village Water District are: Water Availability.

4.4.7 Terrorism Analysis

Population: Approximately 10 percent of the community's population is vulnerable.

Critical Facilities: Approximately 10 percent of the community's critical facilities are vulnerable.

The specific critical facilities vulnerable in Crestline Village Water District are: District Facilities Safety and Security.

4.4.8 Winter Storm

Population: Approximately 100 percent of the community's population is vulnerable.

Critical Facilities: Approximately 10 percent of the community's critical facilities are vulnerable.

The specific critical facilities vulnerable in Crestline Village Water District are: District Safety, Water Availability and Water Appurtenances.

4.4.9 Flooding

Population: Approximately 10 percent of the community's population is vulnerable.

Critical Facilities: Approximately 10 percent of the community's critical facilities are vulnerable.

The specific critical facilities vulnerable in Crestline Village Water District are: District Facilities, Water Mains and Appurtenances.

4.4.10 Dam Inundation

Population: Approximately 1 percent of the community's population is vulnerable.

Critical Facilities: Approximately 10 percent of the community's critical facilities are vulnerable.

The specific critical facilities vulnerable in Crestline Village Water District are: Water Mains and Appurtenances.

4.4.11 Potential Loss Estimation: This section describes the replacement costs and economic impacts from lost facilities:

1. Wildfires

- The economic loss resulting from this hazard is approximately \$71,000.
- The loss from damage to structures from this hazard is approximately \$2,055,000.
- The following is a description of the estimated losses:
 - * Estimated cost to rent an administrative/maintenance facility if the current facility is lost in a wildfire: \$33,000.
 - * Additional operational costs during the period while wildfire is in progress: \$22,000.
 - * Estimated costs to repair or replace Administrative/Maintenance Facility, Pump Houses and other structures: \$2,055,000.

2. Earthquake

- The economic loss resulting from this hazard is approximately \$855,000.
- The loss from damage to structures from this hazard is approximately \$4,795,000.
- The following is a description of the estimated losses:
 - * The District's annual revenues from water sales are approximately \$2,300,000 per year. The value of District structures, water storage tanks, mains and appurtenances is in excess of \$15,000,000. In the event of a major earthquake located in the immediate vicinity of the Crestline Village Water District, it is estimated that there could be a major reduction (25%) in the District's water revenues and that 25% of the District's structures and facilities could be damaged or lost.
 - * The District cost for imported water is \$1,150 per acre foot. The District cost to produce well water is \$372 per acre foot. On an

average, the District produces approximately 40% (250 acre feet) of its annual water supply from wells. If 50% of the wells became unusable due to seismic activity, the additional imported water would have to be purchased from Crestline-Lake Arrowhead Water Agency. The additional annual cost would be \$97,250 (125 AF * \$778).

3. Drought

- The economic loss resulting from this hazard is approximately \$804,000.
- The loss from damage to structures from this hazard is approximately \$0.
- The following is a description of the estimated losses:
 - * During non-drought years, the District purchases approximately 40% (250 acre feet) of its water supply from Crestline-Lake Arrowhead Water Agency (CLAWA). CLAWA purchases water from the California State Water Project, treats it and pumps it up to the communities in the San Bernardino Mountains from Cedarpines Park to Green Valley Lake to supplement the local water supplies. The cost for this water is \$1150 per acre foot. The cost for producing local well water is approximately \$372 per acre foot.

During drought years, the District purchases approximately 70% of its water supply from CLAWA, due to the depletion of the local wells. The additional cost to the District is approximately \$145,875 per year (187.5 AF * \$778 per acre foot).

4. Infestation

- The economic loss resulting from this hazard is approximately \$27,400.
- The loss from damage to structures from this hazard is approximately \$0.
- The following is a description of the estimated losses:

Repair of damage to tanks and structures caused by falling trees.

5. Climate Change

- The economic loss resulting from this hazard cannot be estimated.
- The loss from damage to structures from this hazard is approximately \$0.
- The following is a description of the estimated losses:

Additional labor costs in maintaining the water mains and appurtenances, and in assisting customers with their frozen service lines.

6. Terrorism

- The economic loss resulting from this hazard cannot be estimated.
- The loss from damage to structures from this hazard cannot be estimated.
- The following is a description of the estimated losses:

Additional labor costs in maintaining District facilities, water mains and appurtenances.

7. Winter Storms

- The economic loss resulting from this hazard cannot be estimated.
- The loss from damage to structures from this hazard cannot be estimated.
- The following is a description of the estimated losses:

Additional labor costs in maintaining the water mains and appurtenances, and in assisting customers with their frozen service lines.

8. Flooding

- The economic loss resulting from this hazard cannot be estimated.
- The loss from damage to structures from this hazard cannot be estimated.
- The following is a description of the estimated losses:

Additional labor costs in repairing and maintaining District facilities, water mains and appurtenances.

9. Dam Inundation

- The economic loss resulting from this hazard cannot be estimated.
- The loss from damage to structures from this hazard cannot be estimated.
- The following is a description of the estimated losses:

Additional labor costs in repairing and maintaining the water mains and appurtenances.

Section 5: Community Capability Assessment

This section describes the resources (staffing, agencies, departments, equipment) and tools (existing plans, policies, regulations, and ordinances), the District has in place that can assist, promote and implement mitigation actions in the service area. These capabilities generally fall into the following broad categories:

- Agencies and People
- Existing Plans
- Regulations, Codes, Policies, and Ordinances
- Mitigation Programs and Projects
- Fiscal Resources

5.1 Agencies and People

Crestline Village Water District was formed in 1954 to provide reliable water service to the Crestline area. In 1979, the Lake Gregory area was annexed to the District. The annexation of Lake Gregory doubled the service area and the number of service connections of the District. The District currently has 12 full time employees and reinforces staffing with part-time and seasonal employees as needed. The District estimates the full-time population to be about 7,607, however there is a strong seasonal factor which pushes the peak population to an estimated 13,200 and provides water to 4950 active services. The District averages 6 new water connections per year.

There are few properties in the District's current service area that would provide future development. The current growth rate of .25% is expected to continue.

Other information regarding the District is as follows:

- Established Building Codes: 1998 California Building Code; last updated 01/01/2017
- Local Electric Utilities: Southern California Edison
- Local Water Utilities: Crestline Village Water District
- Local Sewage Treatment Utilities: Crestline Sanitation District
- Local Natural Gas Utilities: The Gas Company
- Local Telephone Utilities: Frontier
- Fire Insurance Rating: Insurance Services Office, Inc evaluated the area the District serves in June 1998. The majority of the District is Class 5.
- Flood Insurance Claims: None

5.2 Existing Plans

This section describes the existing plans for Crestline Village Water District.

Legislation provides the District a safeguard against water supply and some drought hazard protection. In 1991, the amendment to the Urban Water Management and Planning Act, in effect since 1983, requires water suppliers to estimate available water supplies at the end of one, two and three years, and to develop contingency plans for shortages of up to 50 percent. The District's 2015 Urban Water

Management Plan (CVWD, 2016) presents water supply to demand comparisons through 2035. The 2015 UWMP is currently updated and will update any demand and supplies documented in the 2011 UWMP and will also require all water agencies to reduce their water demand by 20 percent by the year 2020. The plan also presents water supply to demand comparisons for single dry to multiple dry year scenarios. The comparisons show that the District has adequate supply through 2035.

The District has an Emergency Response Plan that is a written response plan detailing how the District will respond in the event of an emergency or disaster. The District must be prepared to respond to a variety of threats that require emergency actions by its employees. Potential threats include:

- Operational incidents, such as fire or bacteriological contamination of water associated with District facilities.
- Outsider malevolent acts, such as threatened or intentional contamination of water, intentional damage/destruction of facilities, detection of an intruder or intruder alarm, bomb threat or suspicious mail.
- Natural disasters, such as earthquakes, floods, or wildfires.

5.3 Regulations, Codes, Policies, and Ordinances

During extended droughts, the District does not have enough local water sources to supply all the water needs of its customers. Occasionally, the State experiences severe drought.

The Crestline Village Water District Board of Directors adopted Ordinance No. 35 on August 19, 2014, which outlines a seven-phase “Water Use Reduction Program” for the District. For the purpose of conforming to the Drought Emergency Water Conservation regulations imposed by the SWRCB, the CVWD Board of Directors adopted Resolution No. 421 to amend the District’s Water Conservation Program (Ordinance No. 35) effective May 10, 2015.

5.4 Mitigation Programs

This section serves to identify the Previous Mitigation Plans, Projects and Actions.

For the status of the District’s 2011 HMP Mitigation projects, please see Section 6.2.

Each District vehicle has been provided with a First Aid Kit containing basic first aid supplies. Each kit is packaged in a duffel bag. The District office also has two of these kits; one upstairs and one downstairs.

The District office has a natural gas powered generator for the operation of the District’s Administrative Building and one adjoining well.

5.5 Fiscal Resources

Fiscal Resources for the District include the following:

- Revenue from water sales
- Revenue from water availability assessments
- Fees for new facilities from local developers
- A percentage of local property taxes

Through the State and Federal Hazard Mitigation Assistance Programs, California Department of Water Resources, local grants and/or loans are available for water conservation, groundwater management, and studies and activities to enhance local water supply eligibility. Project eligibility depends on the type of organization(s) applying and participating in the project and the specific type of study or project. More than one grant or loan may be appropriate for a proposed activity. An approved HMP is required to receive federal assistance under the Hazard Mitigation Grant Program (HMGP) or Pre-Disaster Mitigation (PDM) programs. The following website lists the index of potential grants for the District: www.water.ca.gov/funding

Section 6 – Mitigation Strategy

6.1 Overview

The purpose of this analysis is to identify projects (actions) that will help meet the Goals and Objectives for each priority hazard. By going through the process, the District will identify hazards in our community, assess which hazards pose the most significant risk, and identify projects to help reduce and/or eliminate the risk.

6.2 Mitigation 5-Year Progress Report

This updated 2017 HMP identifies the completed, deleted, or deferred actions or activities from the 2011 approved plan as shown in Table 7 as a benchmark for progress. The plan update provides an opportunity for the District to reconsider the range of specific actions.

Further, the updated plan includes in its prioritization, any new mitigation actions identified since the previous plan update process.

Table 7: Status of 2011 HMP Mitigation Actions

<i>Project</i>	<i>Mitigation Action</i>	<i>Completed</i>	<i>Comments</i>
Main Line Replacement	Replace old mains to improve the ability of the distribution system to withstand seismic activity	On-Going – Funded on a “pay as you go” basis.	2,500 LF remaining. Budgeted for Fiscal Year 2015/2016.
Tanks	Upgrade or replace water storage tanks to meet safety and seismic standards	On-Going – Funded by water rates and availability assessments.	Two tanks were completed in 2005. Construction of two new tanks; one in 2015 and one in 2016.
Weed Abatement	Semi-annually remove weeds and excess brush from District Property.	On-Going – Funding generated from water rates	Done in an effort to protect District property in the event of wildfires.
Well Development	Develop additional water sources looking for potential well sites and developing new wells	On-Going – Funding is generated from water rates.	On-Going research and development.
Tree Removal	Semi-annually inspect District properties to identify and schedule removal of infested trees.	On-Going – Funds generated from water rates. Some labor is provided by the Pilot Rock Conservation Camp.	Done in an effort to protect District property in the event of wildfires.

6.3 Mitigation Goals, Objectives, and Projects

The process of identifying goals began with a review and validation of the Goals and Objectives in the 2011 local HMP and the 2010 Operational Area HMP. Using the 2011 HMP as the basis, the District’s planning team completed an assessment of whether each of the goals was still valid. This assessment also led to the opportunity to identify new Goals and Objectives. Also, the 2013 California Water Plan, the 2011 HMP and the 2015 Urban Water Management Plan were used as a guide for mitigation objectives and projects.

The following section provides an overview of the mitigation goals, objectives, and projects.

6.3.1 All Hazards

Description: *Goal is to save lives, reduce injuries, protect infrastructure and reduce economic losses. Many local laws have public safety of citizens as their primary concern. Protecting lives is also the basis for emergency planning, response, and mitigation activities.*

Objectives:

- Continually improve the understanding of the location and potential impacts of natural hazards, the vulnerability of building types, and community development patterns and the measures needed to protect life safety.
- Continually provide state and local agencies with updated information about hazards, vulnerabilities, and mitigation measures.
- Ensure that all local codes and standards ensure the protection of life.
- Ensure that all structures in the District meet minimum standards for life safety.
- Ensure that all development in high-risk areas is protected by mitigation measures that provide for life safety.
- Identify and mitigate all imminent threats to life safety.

6.3.2 Wildfires

Description: *Goal is to reduce vulnerability of the community and District facilities to the danger of wildfires.*

Objectives:

- Provide water to firefighters during an emergency.
- Protect District facilities from wildfires.

Mitigation Projects: Continually make improvements to the District’s facilities so the water system will continually deliver water.

6.3.3 Earthquakes

Description: *Goal is to avoid damages to property and prevent loss of life or injuries.* The District agreed that the strengthening of building, mechanical, and fire codes is critical to the protection of property and life and the reduction of seismic risk, fire and flood hazards. These codes help water utilities design and construct tanks, pump stations, groundwater wells, and pipelines that resist the forces of nature and ensure safety.

Objectives:

- Encourage property protection measures for all communities and structures located in hazard areas.
- Reduce or eliminate all repetitive property losses due to flood, fire and earthquake.
- Research, develop, and adopt cost-effective codes and standards to protect properties beyond the minimum of protecting life safety.
- Establish a partnership among all levels of government and the business community to improve and implement methods to protect property.

Mitigation Projects:

- Install 2500' of new water main.
- Continuous inspection of District facilities.
- Continually make improvements to the District's facilities so the water system will continually deliver water.

6.3.4 Drought

Description: *Goal is to improve drought preparedness.* The goal is to address the drought hazard through mitigation over the long-term and the objectives listed below have been taken from the recently updated California Water Plan (2013).

Objectives:

- Increase water supply – Creating innovative ways to generate new supplies.
- Improve Operational Efficiency & Transfers – this idea is to move water from where it occurs to where it will be used.
- Reduce Water Demand – Water conservation has become a viable long-term supply option because it saves considerable capital and operating cost for the District.
- Improve Water Quality – Improved water quality can directly improve the health of people and provide more water supply to the District.

Mitigation Projects: Construct new groundwater wells.

6.3.5 Infestation

Description: *Goal is to improve infestation preparedness.* The goal is to address the drought hazard through mitigation over the long-term.

Objectives:

- Encourage property protection measures for all communities and structures located in hazard areas.
- Research, develop, and adopt cost-effective codes and standards to protect properties beyond the minimum of protecting life safety.
- Establish a partnership among all levels of government and the business community to improve and implement methods to protect property.

Mitigation Projects: Remove dead trees and brush that may support infestation.

6.3.6 Climate Change

Description: *Goal is to improve climate change preparedness.* The goal is to address the climate change hazard through mitigation over the long-term.

Objectives:

- Increase water supply – Creating innovative ways to generate new supplies.
- Reduce Water Demand – Water conservation has become a viable long-term supply option because it saves considerable capital and operating cost for the District.
- Improve Water Quality – Improved water quality can directly improve the health of people and provide more water supply to the District.

Mitigation Projects: Construct new groundwater wells. Reduce emissions by purchasing clean air vehicles.

6.3.7 Terrorism

Description: *Goal is to improve security preparedness.* The goal is to address the risk hazard through mitigation and awareness.

Objectives:

- Increase awareness.
- Improve Operational facilities and security features.

Mitigation Projects: Awareness training. Secure all appropriate doors, windows and hatches. Install alarms where feasible.

6.3.8 Winter Storms

Description: *Goal is to improve winter storm preparedness.* The goal is to address the winter storm hazard through mitigation over the long-term.

Objectives:

- Maintain District facilities to accommodate snow conditions.
- Maintain snow removal equipment.
- Winter driving and survival training.

Mitigation Projects: Weekly inspections of all facilities and vehicles. Supply personnel with appropriate winter clothing.

6.3.9 Flooding

Description: *Goal is to comply with the National Flood Insurance Program (NFIP).*

The District is not a member of the National Flood Insurance Program (NFIP) and is fortunate to not have any identified Repetitive and Severe Loss properties.

6.3.10 Dam Inundation

Description: *Goal is to improve dam inundation preparedness.* The goal is to address the dam inundation hazard through mitigation over the long-term.

Objectives:

- Continuous inspection of District facilities.
- Continually make improvements to the District's facilities so the water system will continually deliver water.
- Relocation of watermain during San Bernardino County Dam Rehabilitation Project.

6.4 Mitigation Priorities

The District's implementation strategy includes first identifying a set of first tier objectives. These objectives are considered the highest priority and once implemented will result in substantial improvement in the overall reliability of the system. The remaining objectives, not included in the first tier objectives, are considered desirable and will further enhance the system reliability once the first tier objectives are achieved.

6.5 Implementation Strategy and Analysis of Mitigation Projects

For the successful mitigation of hazards identified in the plan and to meet Crestline Village Water District’s goals within a reasonable time frame, an implementation strategy has been developed. The strategy includes an identification of the objectives identified in Section 6.3, development of planning level cost estimates and a time frame for implementation.

The implementation strategy focuses on the high priority mitigation projects that have available funding, offer the largest amount of mitigation for the funding available and can be implemented during the five-year plan cycle.

As shown in Table 8, the implementation strategy includes the potential funding source, timeframe for completion, and cost estimate.

Table 8

(Dollar Amounts in Thousands)

Project No.	Primary Hazard	Total Cost	Available Financing								Total Funding				
			CVWD		County		State		Federal			Other			
			Amt.	FY	Amt.	FY	Amt.	FY	Amt.	FY		Amt.	FY		
Tree/Weed Abatement	Infestation/Wildfires	\$44	\$22	17-22	\$0		\$0		\$0		\$0		\$0		\$22
Alternate Power	Earthquake/Wildfires	\$220	\$0	17-22	\$0		\$0		\$0		\$0		\$0		\$0
Water Main Replacement	Earthquake/Wildfires	\$150	\$150	17-18	\$0		\$0		\$0		\$0		\$0		\$150
Tanks Retrofit	Drought/Earthquake	\$2,750	\$0	18-19	\$0		\$0		\$0		\$0		\$0		\$0
New Well Development	Drought/Wildfires	\$270	\$270	17-22	\$0		\$0		\$0		\$0		\$0		\$270
TOTALS			\$3,434	\$442											

Section 7: Plan Maintenance

7.1 Monitoring, Evaluating and Updating the Plan

Plan Last Updated On: July 16, 2011

Description of Plan Maintenance Procedures: Because the Plan is a living document that reflects the District's ongoing hazard mitigation activities, the process of monitoring, evaluating, and updating it will be critical to the effectiveness of hazard mitigation in the District's area.

The District's planning team has the responsibility for maintaining, evaluating, and updating the Plan. The planning team will review annually each goal and objective to determine their relevance to changing situations within the District, as well as changes in the County, State, or Federal policy, and ensure that they are addressing current and expected conditions. The team will also review the risk assessment portion of the plan to determine if this information should be updated or modified. The planning team will also review the previous mitigation projects and implementation processes to evaluate what worked well, any difficulties encountered, coordination efforts with other water districts, and any strategies that should be revised.

The San Bernardino County OES will play a pivotal role in providing input, direction, and guidance. The District's Board of Director's will review and recommend for approval any plan updates proposed by the planning team. The Plan will be updated at least every five years.

7.2 Implementation through Existing Programs

This plan will be used along with the District's Urban Water Management Plan and Vulnerability Assessment, to continually evaluate District Hazard Mitigation needs. Capital budgeting requirements will be included into capital improvement plans as deemed appropriate by the Crestline Village Water District Board of Directors.

The General Manager and Field Supervisor will conduct reviews of the facilities on a biannual basis to determine if there are any updates needed to each sites mitigation plan.

Review of community needs will be coordinated with the Mountains Mutual Aid Organization and other water purveyors and companies in the San Bernardino Mountains.

7.3 Continued Public Involvement

The District will involve the public during the plan maintenance process over the next five years. The District will incorporate the hazard mitigation plan in its yearly budget planning process to ensure continued public involvement in this plan. The annual budget process and approval is an open public process. As part of the approval process the budget is presented to the District's Board of Directors in an open public meeting and by virtue of this, progress towards achieving the District's goals and objectives identified in the hazard mitigation plan will also be open to public review and comment on an annual basis.

Appendix A: Public Involvement/Outreach

A.1 Planning Process and Public Involvement

Public involvement consisted of the following events:

<i>Date</i>	<i>Activity</i>
April 11, 2017	Posted to the Crestline Village Water District website. www.cvwater.com
April 11, 2017	California Bank & Trust, 23840 Lake Drive, Crestline, Ca 92325 Posted flyer inviting public to comment on Draft Hazard Mitigation Plan via Crestline Village Water District website. www.cvwater.com
April 11, 2017	Lake Drive Hardware, 23895 Lake Drive, Crestline, Ca 92325 Posted flyer inviting public to comment on Draft Hazard Mitigation Plan via Crestline Village Water District website. www.cvwater.com
April 11, 2017	United States Postal Service, 23921 Lake Drive, Crestline Ca 92325 Posted flyer inviting public to comment on Draft Hazard Mitigation Plan via Crestline Village Water District website. www.cvwater.com
April 11, 2017	Rim Bowling and Entertainment Center, 23991 Lake Drive, Crestline, Ca 92325 Posted flyer inviting public to comment on Draft Hazard Mitigation Plan via Crestline Village Water District website. www.cvwater.com
April 11, 2017	Crest Forest Senior Citizen Club, 24568 San Moritz Drive, Crestline Ca 92325 Posted flyer inviting public to comment on Draft Hazard Mitigation Plan via Crestline Village Water District website. www.cvwater.com
April 11, 2017	San Bernardino County Library, 24105 Lake Gregory Drive, Crestline, Ca 92325 Posted flyer inviting public to comment on Draft Hazard Mitigation Plan via Crestline Village Water District website. www.cvwater.com
April 11, 2017	Goodwin & Sons Market, 24089, Lake Gregory Drive, Crestline, Ca 92325 Posted flyer inviting public to comment on Draft Hazard Mitigation Plan via Crestline Village Water District website. www.cvwater.com



Providing our community with a reliable water system
that delivers high quality water for its health and safety needs.

Crestline Village Water District

Is inviting the community to comment on the 2017 Hazard Mitigation Plan. The 2017 Plan will have the latest information on natural hazards that affect our District and Community.

If you wish to review the Draft 2017 Hazard Mitigation Plan you can find it on the Crestline Village Water District website:

www.cvwater.com

If you have questions, suggestions, or comments on the 2017 Hazard Mitigation Plan please send an email to:

aeclanin@cvwater.com

The District will accept comments until May 12, 2017 at 4:30 PST

<i>Date</i>	<i>Activity</i>
June 23, 2016	Multi-Jurisdictional Hazard Mitigation Plan (MJHMP) Kick-Off Meeting.
October 24, 2016	Multi-Jurisdictional Hazard Mitigation Plan (MJHMP) 2016-2017 Update Stakeholder Update #2 Conference Call.
February 02, 2017	Established Multi-Jurisdictional Hazard Mitigation Plan (MJHMP) Update Team.
February 06, 2017	Review of 2011 Hazard Mitigation Plan
February 13, 2017	Multi-Jurisdictional Hazard Mitigation Plan Update Team Strategy Meeting.
February 14, 2017	Multi-Jurisdictional Hazard Mitigation Plan (MJHMP) 2016-2017 Update Stakeholder Update #4 Conference Call.
February 16, 2017	Out-reach Meeting with Crestline Sanitation District.
February 16, 2017	Out-reach Meeting with Crestline-Lake Arrowhead Water Agency.
February 21, 2017	Board Meeting – Public Meeting. Discussed with the Board of Directors the requirements for updating the 2016 Multi-Jurisdictional Hazard Mitigation Plan. See agenda and minutes.
March 21, 2017	Board Meeting- Public Meeting – Provided the Board and public with an update of the progress on the 2016 Plan. See agenda and minutes.
March 28, 2017	San Bernardino County Fire Office of Emergency Services. Multi-Jurisdictional Hazard Mitigation Plan 2016-17 Update. Stakeholder Update Meeting # 5.
April 05, 2017	FEMA G-318 Local Mitigation Planning Workshop
April 06, 2017	FEMA G-318 Local Mitigation Planning Workshop

A.2 Board Agendas and Minutes

CRESTLINE VILLAGE WATER DISTRICT

DRAFT

A G E N D A

REGULAR MEETING

February 21, 2017

The Regular Meeting of the Board of Directors will be held on Tuesday, February 21, 2017 at 3:00 PM, at the office of the District, located at 777 Cottonwood Drive in Crestline, California.

CALL TO ORDER AND FLAG SALUTE:

APPROVAL OF MINUTES: Regular Meeting of January 17, 2017. *

APPROVAL OF CASH DISBURSEMENTS: January 2017. *

PUBLIC COMMENTS:

PUBLIC HEARING

REGULAR SESSION:

1. Review Customer Correspondence, Trina Brettmann, DBA Sleepy Hollow, 24047 Lake Drive, Account No. 36-1378-00.
2. Consider Bids on Surplus Property Lot A, APN 0338-083-53, Mary Tone School. *
3. Consider Change in Authorized Signers; California Bank and Trust, Arrowhead Credit Union and Local Agency Investment Fund. *
4. Adopt Resolution Revising Investment Policy. *
5. Adopt Resolution Extending Temporary Water Use Restrictions. *
6. Discuss Form 700 for Directors.
7. Consider a Concurring Resolution for ACWA/JPIA Executive Committee. *
8. Update on Billing System Software.
9. Update on Hazard Mitigation Plan.
10. Consider Attendance at LAFCO Governance Training, March 22, 2017, Rancho Cucamonga, CA. *
11. Consider Attendance at ACWA/JPIA Spring Conference; Week of May 8-12, 2017, Monterey, California. *

MANAGER'S REPORT:

1. Update on District Projects.
2. Monthly Financial and Investment Reports.
3. Monthly Water Production Reports.

DIRECTORS' REPORTS:

1. Report on ACWA.JPIA Region 9 Conference, January 19, 2018, Coachella, CA.
2. Report on LAFCO 101 Training, January 24, 2017, San Bernardino, CA.
3. Requests for Future Agenda Items.

NEXT SCHEDULED BOARD MEETING: Tuesday, March 21, 2017 at 3:00 PM.

* Planned Board Action. The Board of Directors may take action on any agenda item.

**MINUTES OF THE REGULAR MEETING OF THE BOARD OF
DIRECTORS OF CRESTLINE VILLAGE WATER DISTRICT**

FEBRUARY 21, 2017

CALL TO ORDER AND FLAG SALUTE: President Bracher called the Regular Meeting of the Board of Directors of Crestline Village Water District to order at 3:03 pm, on Tuesday, February 21, 2017, at the regular meeting place of said Board at its office in Crestline, California.

ROLL CALL: Present were President Connie Bracher, Directors Darel Davis, Steven Farrell, Robert Kinzel and Kenneth Stone.

Staff members present were General Manager Karl B. Drew, Office Manager Larrie Davis, Engineer Wally Franz, Attorney Ronald Van Blarcom, and Assistant General Manager Alan E. Clanin.

Absent was Field Supervisor Chris Heryford.

Also present was Trina Brettmann of Sleepy Hollow Motel.

MINUTES OF PREVIOUS MEETING: On a motion by Director Kinzel and a second by Director Farrell, the minutes of the Regular Meeting of January 17, 2017 were unanimously approved as written.

CASH DISBURSEMENTS: The Board reviewed the cash disbursements for the month of January 2017. On a motion by Director Davis and a second by Director Kinzel the cash disbursements for the month of January 2017 were unanimously approved.

PUBLIC COMMENTS: None

REVIEW CUSTOMER CORRESPONDENCE, TRINA BRETTMANN, DBA SLEEPY HOLLOW, 24047 LAKE DRIVE, ACCOUNT NO. 36-1378-00:

President Bracher recused herself and left the board room to avoid any conflict of interest.

Manager Karl B. Drew introduced Ms. Trina Brettmann and gave a brief summary of a leak that occurred on Ms. Brettmann's property. Ms. Brettmann filed a request to address the Board and to have further reductions applied to her account.

Ms. Brettmann addressed the Board stating that the District Staff failed to notify her of her leaking water service and that she had grown accustomed to this courtesy notification in the past. Ms. Brettmann further stated that she had not

been checking her billing statement regularly as she had automatic payment arrangements and has always trusted the District.

The Board was sympathetic to Ms. Brettmann, but could not offer a further reduction as it is the customer's responsibility to maintain their water system, that leak notification from the District is a courtesy and not a guarantee, and that a further reduction was not fair to the other ratepayers of the District.

Director Farrell recommended that staff review the procedures for notifying customers on the leak list and that planned upgrades to the District computer software may alleviate this issue in the future.

The District has offered Ms. Brettmann a one-time reduction of 10 percent with payment arrangements not to exceed 6 months. Additionally, since the leak continued into March, Ms. Brettmann's March billing should be analyzed to determine if the 10 percent reduction should be applied to the March bill as well.

No action was taken by the board.

CONSIDER BIDS ON SURPLUS PROPERTY LOT A, APN 0338-083-53, MARY TONE SCHOOL: President Bracher continued to recuse herself and remained absent from the board room to avoid any conflict of interest.

Manager Drew reported that the District received two sealed bids for the surplus property at Mary Tone School. As Mary Tone LLC was the highest bidder, staff recommended the Board accept the bid from Mary Tone LLC. One bid was from Jerry Koston in the amount of \$5,656.00 and one from Mary Tone LLC in the amount of \$10,001.

On a motion from Director Stone and a second by Director Davis, the Board voted unanimously to accept the bid of \$10,001 from Mary Tone LLC and authorized the Manager Drew to sign the necessary documents to finalize the pipeline easement and sale of the surplus property, on the following roll call vote:

AYES: Directors Davis, Farrell, Kinzel and Stone.

NOES: None

ABSENT: Director Bracher

ABSTAINED: None

CONSIDER CHANGE IN AUTHORIZED SIGNERS; CALIFORNIA BANK & TRUST, ARROWHEAD CREDIT UNION, LOCAL AGENCY INVESTMENT FUND SIGNATURE CARDS: Manager Drew reviewed the proposed change with the Board. With the addition and removal of one Board Member the District needs to update the bank signature cards for the two checking accounts at California Bank & Trust, and the one checking account and one savings account at Arrowhead Credit Union.

Currently the seven authorized signers for the accounts are Board Members Connie Bracher, Darel Davis, Kenneth Stone, and Steven Farrell, Secretary/General Manager Karl Drew, Office Manager Larrie Ann Davis and Assistant Manager Alan Clanin.

Two authorized signatures are required for withdrawal of funds from the Checking

Accounts, except as follows:

- One authorized signature is required to make transfers between any District accounts at California Bank & Trust.
- One authorized signature is required to make transfers between any District Account at Arrowhead Credit Union.

With the appointment of Director Kinzel, the Board needs to authorize new signature cards that include all authorized signers.

Assistant Manager Alan Clanin has been an authorized signer on both bank accounts in the capacity of Director. He may be left on the accounts in his new capacity as Assistant General Manager if the Board desires.

- One authorized signature is required to make wire transfers between any District accounts at California Bank and Trust with the Local Agency Investment Fund (LAIF) in Sacramento.

With the change of Board Members, the Board needs to authorize the addition of President Connie S. Bracher as an authorized signature. There are only three signers on this account, the General Manager, the Office Manager and the President of the Board.

On a motion by Director Stone and a second by Director Davis, the Board unanimously approved the following authorized signatures at California Bank and Trust and Arrowhead Credit Union: Directors Connie Bracher, Darel Davis, Steven Farrell, Robert Kinzel and Kenneth Stone, Secretary/General Manager Karl Drew, Office Manager Larrie Ann Davis and Assistant Manager Alan Clanin, and the following authorized signatures at Local Agency Investment Fund (LAIF): Director Connie Bracher, Secretary/General Manager Karl Drew and Office Manager Larrie Ann Davis.

ADOPT RESOLUTION NO. 431, REVISING INVESTMENT POLICY: Manager Drew explained that the Investment Policy is to be reviewed by the Board annually. Currently the District only invests in the State of California Local Agency Investment Fund (LAIF) which diversifies their investments.

After review by Attorney Van Blarcom, changes were made to Section 8 of the Investment Policy as well as some numbering changes and typographical errors within the document. The Board was provided a copy of the updated policy for review.

On a motion by Director Davis and a second by Director Farrell, the Board adopted
Resolution No. 431, revising the investment policy, on the following roll call vote:

AYES: Directors Bracher, Davis, Farrell, Kinzel and Stone.

NOES: None

ABSENT: None

ABSTAINED: None

ADOPT RESOLUTION NO. 432, EXTENDING TEMPORARY WATER USE RESTRICTIONS: General Manager Drew recommended to the Board that the District amend the District's Water Conservation Program extending the existing water use restrictions for another 270 days to maintain compliance with the State Water Resources Control Board. The District will review this ordinance again in May 2017 to follow the next State review.

On a motion by Director Stone and a second by Director Davis, the Board adopted
Resolution No. 432, extending the temporary water use restrictions, on the following roll call vote:

AYES: Directors Bracher, Davis, Farrell, Kinzel and Stone.

NOES: None

ABSENT: None

ABSTAINED: None

DISCUSS FORM 700 FOR DIRECTORS: Manager Drew reviewed with Directors the purpose and filing process of Form 700. All completed forms need to be returned to the District no later than April 3, 2017.

CONSIDER A CONCURRING RESOLUTION FOR ACWA/JPIA: Manager Drew notified the Board that the ACWA/JPIA Executive Committee Election process is requiring that candidates for the election each receive concurring nomination resolutions from three other JPIA members. Manager Drew stated the District has received requests from two candidates, Melody McDonald and Kathleen Tiegs.

Director Farrell stated that he would like to express support for both candidates and asked that this item be included on next month's agenda.

UPDATE ON BILLING SYSTEM SOFTWARE: Assistant Manager Clanin reported to the Board that District Staff has been evaluating accounting and billing software systems to replace the aging system the District currently uses. The District is primarily interested in a server based system due to the unreliability of internet. The cost of new software and implementation that will meet the District requirements is estimated to be around \$100,000.

Assistant Manager Clanin will keep the Board updated on the progress.

UPDATE ON HAZARD MITIGATION PLAN: Assistant Manager Clanin reported that District Staff is in the process of updating the 2011 Hazard Mitigation Plan. Manager Clanin informed the Board that this update is a requirement for eligibility of grants or FEMA funds.

Assistant Manager Clanin will keep the Board updated on the progress.

CONSIDER ATTENDANCE AT LAFCO GOVERNANCE TRAINING, MARCH 22, 2017:

The Board discussed on going LAFCO Training Session notices. In the future, Staff will email training notices to each Director. If a Director is interested in an upcoming event, Staff will add the item to a future Agenda for Board consideration. Directors are not interested in attending the Governance Training on March 22, 2017.

CONSIDER ATTENDANCE AT ACWA/JPIA SPRING CONFERENCE, WEEK OF MAY 8-12, 2017: Directors Davis and Farrell expressed interest in attending this event. On a motion by Director Farrell and a second by Director Davis, the Board unanimously approved attendance to the ACWA/JPIA Spring Conference for the General Manager and any Director choosing to attend.

MANAGER'S REPORT: General Manager Drew gave a brief update on the following District projects:

- Lakeview Main Replacement
- Electra Vertical Well
- Valle Vertical Well
- Zurich Tank Paving and Fencing
- Billing Software
- Board Room Update
- Office Partitions

The Board requested that the office roofing project be added to the list.

DIRECTORS' REPORTS: Director Farrell submitted an oral report on his attendance at the ACWA Region 9 Board Meeting held on January 19, 2017 in Desert Hot Springs.

Director Kinzel submitted a written report on his attendance at the LAFCO 101 training at the Norton Regional Event Center on January 24, 2017. There was general discussion regarding both events.

As there was no further business to discuss, the meeting was adjourned at 5:24 pm.

The next regular board meeting is scheduled for Tuesday, March 21, 2017 at 3:00 pm.

CRESTLINE VILLAGE WATER DISTRICT

A G E N D A

REGULAR MEETING

March 21, 2017

The Regular Meeting of the Board of Directors will be held on Tuesday, March 21, 2017 at 3:00 PM, at the office of the District, located at 777 Cottonwood Drive in Crestline, California.

CALL TO ORDER AND FLAG SALUTE:

APPROVAL OF MINUTES: Regular Meeting of February 21, 2017. *
Special Meeting of March 8, 2017. *

APPROVAL OF CASH DISBURSEMENTS: February 2017. *

PUBLIC COMMENTS:

REGULAR SESSION:

1. Review Preliminary Cash Budget for Fiscal Year 2017/18.
2. Consider Nomination for California Special Districts (CSDA) Board of Directors Seat C. *
3. Update on Billing System Software.
4. Update of Hazard Mitigation Plan.
5. Consider Changing April Board Meeting Date to April 25, 2017. *

MANAGER'S REPORT:

1. Update on Projects
2. Monthly Financial and Investment Reports.
3. Monthly Water Production Reports.

DIRECTORS' REPORTS:

1. Director's Reports.
2. Requests for Future Agenda Items.

NEXT SCHEDULED BOARD MEETING: Tuesday, April 18, 2017 at 3:00 PM.

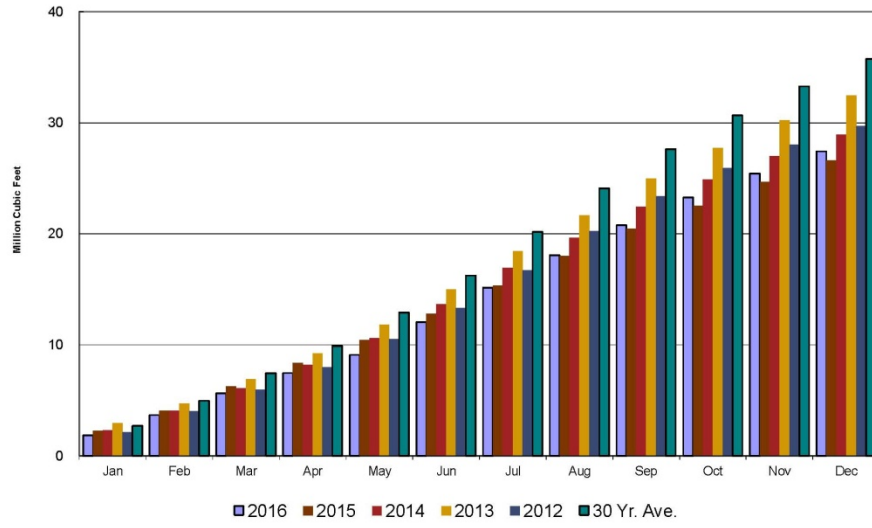
* Planned Board Action. The Board of Directors may take action on any agenda item.

Appendix B

B.1 Sources of Supply

Crestline Village Water District

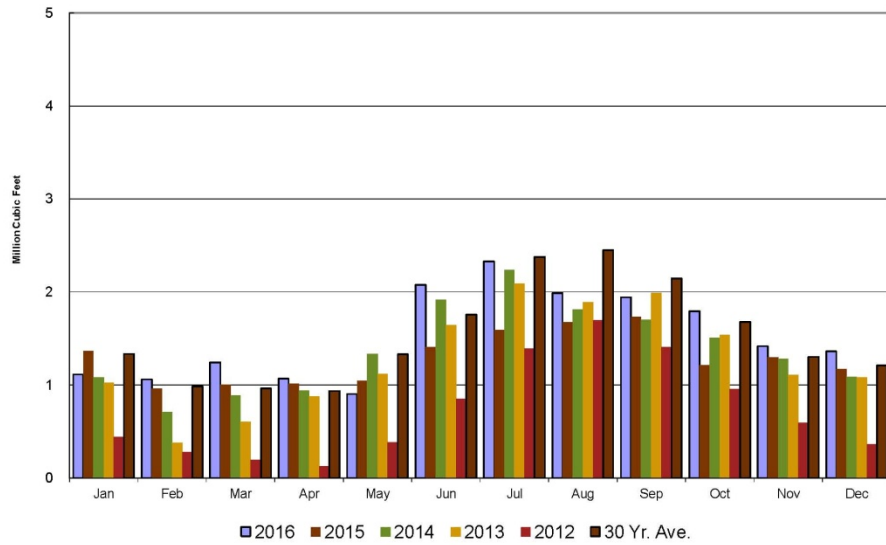
Total Production Cumulative



B.2.

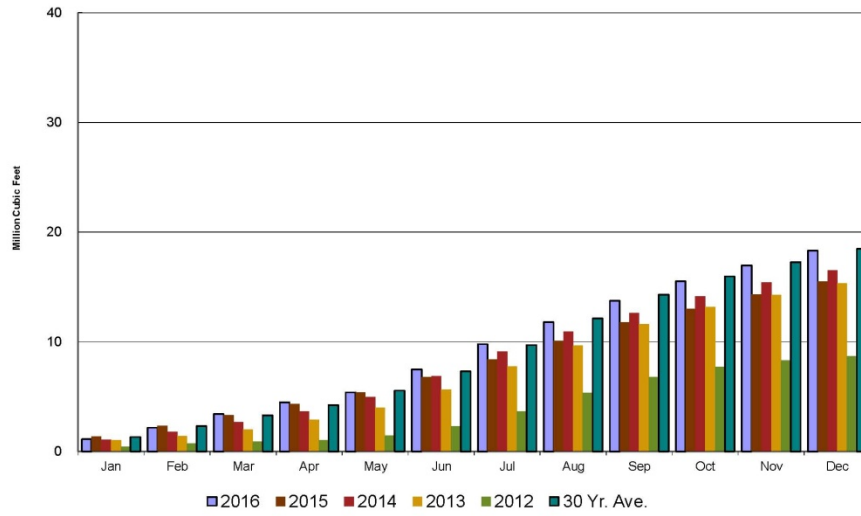
Crestline Village Water District

Purchased Water by Month



B.3.

Crestline Village Water District
Purchased Water Cumulative



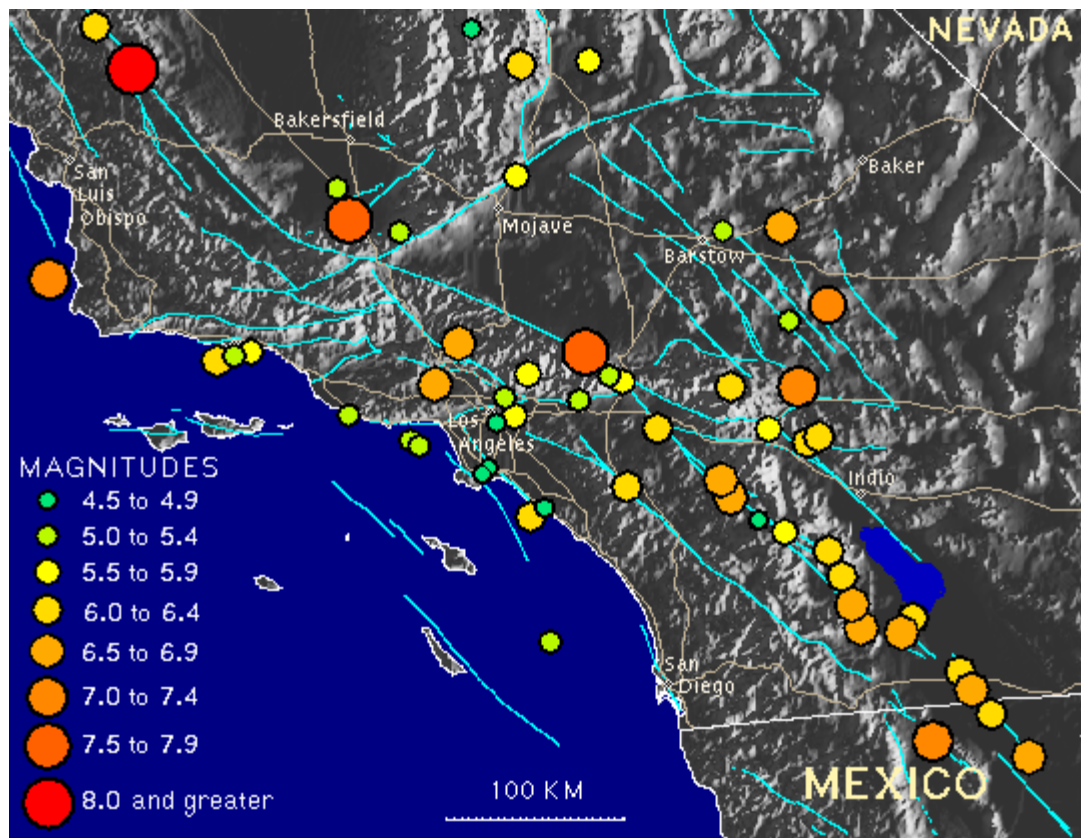
Appendix C

C.1 Probability of Earthquakes

The following information was obtained from the Southern California Earthquake Data center.

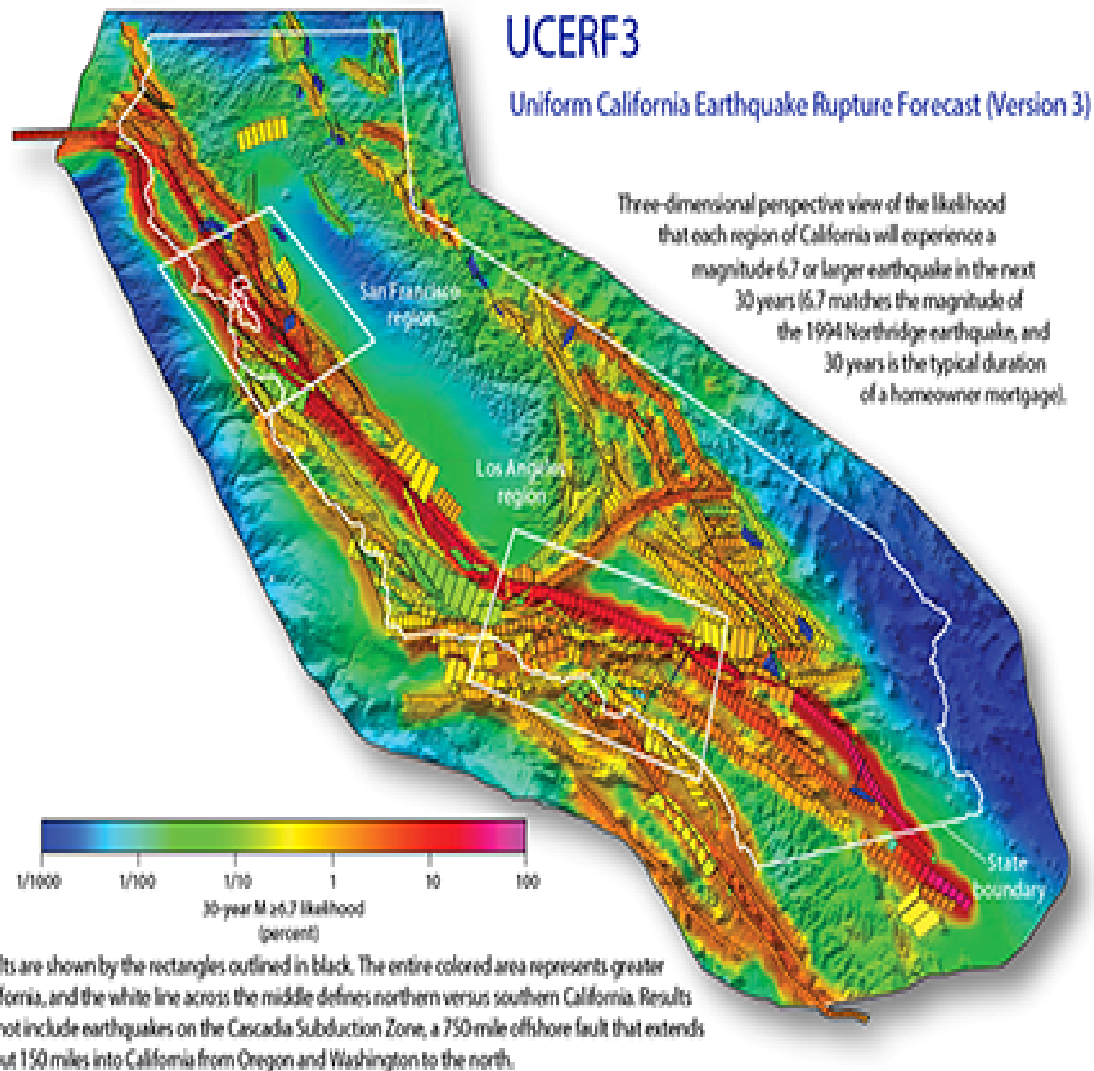
Below is a map of Southern California, with epicenters of historic earthquakes, dating as far back as 1812. Major highways (in tan) and the surface traces of major faults (in greenish blue).

This map does not show the epicenters of all earthquakes greater than magnitude 4.5 recorded in the southern California area since the 19th century. It is meant as an overview of large and destructive, fairly recent, or unusual earthquakes. The magnitudes given by the scale are generally moment magnitudes (denoted M_w), for earthquakes above magnitude 6, and local magnitudes (denoted M_L), for most earthquakes below magnitude 6 and for earthquakes which occurred before accurate instrumental measurements of magnitude were possible (i.e. before 1933).



Appendix C

C.2



Appendix C

C.3 Map of Southern California Faults

