BIG BEAR FIRE AUTHORITY,
CITY OF BIG BEAR LAKE,
BIG BEAR CITY COMMUNITY SERVICES DISTRICT,
BIG BEAR MUNICIPAL WATER DISTRICT

LOCAL HAZARD MITIGATION PLAN

September 2020

Primary Points of Contact:

Mike Maltby
Asst. Chief
Fire Marshal
Big Bear Fire Authority
P.O. Box 2830
Big Bear Lake, CA 92315
(909) 866-7566 (Office)

Phil Mosley **(Retired, 3-20)**
Director of Community Services/
Deputy Director of Emergency Services
City of Big Bear Lake
P.O. Box 10000
Big Bear Lake, CA 92315
(909) 752-2892 (Office)

Planning Team and Promulgation Authority

This Hazard Mitigation Plan for the Big Bear Fire Authority, City of Big Bear Lake, Big Bear City Community Services District, and Big Bear Municipal Water District was:

Prepared by:

Signature: _____ Date: 6/1/2021
Name: Miko Maltby
Title: Asst. Chief – Fire Marshal
Organization: Big Bear Fire Authority

Signature: _____ Date: _____
Name: Frank Rush
Title: General Manager
Organization: City of Big Bear Lake

Signature: _____ Date: _____
Name: Mary Reeves
Title: General Manager
Organization: Big Bear City Community Services District

Signature: _____ Date: _____
Name: Mike Stephenson
Title: General Manager
Organization: Big Bear Municipal Water District

Approved by the Big Bear Fire Authority Board:

Approval Attested To By:

Signature: Dawn E. Marschinke Date: 6/17/21
Name: Dawn E. Marschinke
Title: Board Secretary
Organization: Big Bear Fire Authority

Approved by the City of Big Bear Lake City Council:

Approval Attested To By:

Signature: _____ Date: _____
Name: Erica Stephenson
Title: City Clerk
Organization: City of Big Bear Lake

Planning Team and Promulgation Authority

This Hazard Mitigation Plan for the Big Bear Fire Authority, City of Big Bear Lake, Big Bear City Community Services District, and Big Bear Municipal Water District was:

Prepared by:

Signature:_____ Date:_____
Name: Mike Maltby
Title: Asst. Chief – Fire Marshal
Organization: Big Bear Fire Authority

Signature: Frank Rush (Aug 25, 2021 16:58 PDT) Date: Aug 25, 2021
Name: Frank Rush
Title: General Manager
Organization: City of Big Bear Lake

Signature:_____ Date:_____
Name: Mary Reeves
Title: General Manager
Organization: Big Bear City Community Services District

Signature:_____ Date:_____
Name: Mike Stephenson
Title: General Manager
Organization: Big Bear Municipal Water District

Approved by the Big Bear Fire Authority Board:

Approval Attested To By:

Signature:_____ Date:_____
Name: Dawn E. Marschinke
Title: Board Secretary
Organization: Big Bear Fire Authority

Approved by the City of Big Bear Lake City Council:

Approval Attested To By:

Signature: Erica Stephenson (Aug 25, 2021 17:28 PDT) Date: Aug 25, 2021
Name: Erica Stephenson
Title: City Clerk
Organization: City of Big Bear Lake

Planning Team and Promulgation Authority

This Hazard Mitigation Plan for the Big Bear Fire Authority, City of Big Bear Lake, Big Bear City Community Services District, and Big Bear Municipal Water District was:

Prepared by:

Signature:_____ Date:_____
Name: Mike Maltby
Title: Asst. Chief – Fire Marshal
Organization: Big Bear Fire Authority

Signature:_____ Date:_____
Name: Frank Rush
Title: General Manager
Organization: City of Big Bear Lake

Signature: Mary T. Reeves Date: 6-8-21
Name: Mary Reeves
Title: General Manager
Organization: Big Bear City Community Services District

Signature:_____ Date:_____
Name: Mike Stephenson
Title: General Manager
Organization: Big Bear Municipal Water District

Approved by the Big Bear Fire Authority Board:

Approval Attested To By:

Signature:_____ Date:_____
Name: Dawn E. Marschinke
Title: Board Secretary
Organization: Big Bear Fire Authority

Approved by the City of Big Bear Lake City Council:

Approval Attested To By:

Signature:_____ Date:_____
Name: Erica Stephenson
Title: City Clerk
Organization: City of Big Bear Lake

Planning Team and Promulgation Authority

This Hazard Mitigation Plan for the Big Bear Fire Authority, City of Big Bear Lake, Big Bear City Community Services District, and Big Bear Municipal Water District was:

Prepared by:

Signature:_____ Date:_____
Name: Mike Maltby
Title: Asst. Chief – Fire Marshal
Organization: Big Bear Fire Authority

Signature:_____ Date:_____
Name: Frank Rush
Title: General Manager
Organization: City of Big Bear Lake

Signature:_____ Date:_____
Name: Mary Reeves
Title: General Manager
Organization: Big Bear City Community Services District

Signature:_____ Date: 10/20/2021
Name: Mike Stephenson
Title: General Manager
Organization: Big Bear Municipal Water District

Approved by the Big Bear Fire Authority Board:

Approval Attested To By:

Signature:_____ Date:_____
Name: Dawn E. Marschinke
Title: Board Secretary
Organization: Big Bear Fire Authority

Approved by the City of Big Bear Lake City Council:

Approval Attested To By:

Signature:_____ Date:_____
Name: Erica Stephenson
Title: City Clerk
Organization: City of Big Bear Lake

Contents

Big Bear Fire Authority Resolution No. 2020-XX

RESOLUTION NO. 2020-XX

A RESOLUTION OF THE BOARD OF DIRECTORS OF THE BIG BEAR FIRE AUTHORITY, COUNTY OF SAN BERNARDINO, STATE OF CALIFORNIA, ADOPTING THE 2020 LOCAL HAZARD MITIGATION PLAN UPDATE, AND AUTHORIZING FUTURE NON-SUBSTANTIVE AMENDMENTS TO THE PLAN

WHEREAS, the preservation of life and property is an inherent responsibility of local, State and Federal government; and

WHEREAS, the Big Bear Fire Authority joined with the City of Big Bear Lake, the Big Bear City Community Services District, Big Bear Municipal Water District, and agencies in San Bernardino County to develop, adopt and maintain a multi-jurisdictional Hazard Mitigation Plan; and

WHEREAS, the Big Bear Fire Authority is charged and entrusted with the protection of persons and property prior to and during emergencies, and/or disaster conditions; and

WHEREAS, the goal of a Hazard Mitigation Plan is to minimize, reduce or eliminate loss of life and/or property; and

WHEREAS, this Hazard Mitigation Plan represents a comprehensive description of the Big Bear Fire Authority's commitment to reducing, preventing or eliminating potential impacts of disasters caused by natural and human-caused hazards; and

WHEREAS, the Big Bear Fire Authority has undertaken a comprehensive planning effort in developing the Local Hazard Mitigation Plan by organizing resources, assessing risks, and developing and implementing a mitigation plan and monitoring process; and

WHEREAS, the Hazard Mitigation Plan is a Federal requirement under the Disaster Mitigation Act of 2000 for the Big Bear Fire Authority, City of Big Bear Lake and the Big Bear City Community Services District to receive Federal funds for disaster recovery and mitigation; and

WHEREAS, the Hazard Mitigation Plan established a coordinated effort to support mitigation activities and identifies measures to combat natural and man-made hazards within our jurisdiction; and

WHEREAS, the Hazard Mitigation Plan is an extension of the State of California Multi-Hazard Mitigation Plan, and will be reviewed and exercised periodically and revised as necessary to meet changing conditions; and

WHEREAS, the Big Bear Fire Authority agrees to adopt this Hazard Mitigation Plan and urges all officials, employees, public and private organizations, and citizens, individually and collectively, to do their share in furthering the goals and objectives of hazard mitigation within the Big Bear Fire Authority.

NOW, THEREFORE, the Board of Directors of the Big Bear Fire Authority District DOES HEREBY RESOLVE, DETERMINE AND ORDER AS FOLLOWS:

Section 1. The Board approves the Local Hazard Mitigation Plan of the Big Bear Fire Authority.

Section 2. The Board authorizes the Fire Chief to make necessary administrative and operational changes to the plan that are in keeping with the intent of the plan as approved.

Section 3. The Board authorizes the Fire Chief, or his duly appointed representative, to perform all duties required to carry out the Local Hazard Mitigation Plan.

Section 4. That the Board Secretary shall certify to the passage and adoption of this resolution and enter it into the book of original resolutions.

PASSED, APPROVED and ADOPTED this XXth day of XXXXX, 2020.

AYES:
NOES:
ABSENT:

_____ _____

Date XXXXX, Chairman

ATTEST:

_____

Dawn E. Marschinke, Board Secretary

City of Big Bear Lake Resolution No. 2020-XX

RESOLUTION NO. 2020-XX

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF BIG BEAR LAKE, COUNTY OF SAN BERNARDINO, STATE OF CALIFORNIA, ADOPTING THE 2020 LOCAL HAZARD MITIGATION PLAN UPDATE, AUTHORIZING FUTURE NON-SUBSTANTIVE AMENDMENTS TO THE PLAN, AND RESCINDING RESOLUTION NO.2020-XX

WHEREAS, the preservation of life and property is an inherent responsibility of local, State and Federal government; and

WHEREAS, the City of Big Bear Lake joined with agencies in San Bernardino County to develop, adopt and maintain a multi-jurisdictional Hazard Mitigation Plan; and

WHEREAS, the City is charged and entrusted with the protection of persons and property prior to and during emergencies, and/or disaster conditions; and

WHEREAS, the goal of a Hazard Mitigation Plan is to minimize, reduce or eliminate loss of life and/or property; and

WHEREAS, this Hazard Mitigation Plan represents a comprehensive description of the City's commitment to reducing, preventing or eliminating potential impacts of disasters caused by natural and human-caused hazards; and

WHEREAS, the City of Big Bear Lake previously adopted its Hazard Mitigation Plan with the adoption of Resolution No. 2020-XX; and

WHEREAS, the City Council desires to rescind Resolution No. 2020-XX and adopt the updated Hazard Mitigation Plan in accordance with the Disaster Mitigation Act of 2000; and

WHEREAS, the City has undertaken a comprehensive planning effort in developing the Local Hazard Mitigation Plan by organizing resources, assessing risks, and developing and implementing a mitigation plan and monitoring process; and

WHEREAS, the Hazard Mitigation Plan is a Federal requirement under the Disaster Mitigation Act of 2000 for the City to receive Federal funds for disaster recovery and mitigation; and

WHEREAS, the Hazard Mitigation Plan established a coordinated effort to support mitigation activities and identifies measures to combat natural and man-made hazards within our City; and

WHEREAS, the Hazard Mitigation Plan is an extension of the State of California Multi-Hazard Mitigation Plan, and will be reviewed and exercised periodically and revised as necessary to meet changing conditions; and

WHEREAS, the City of Big Bear Lake agrees to adopt this Hazard Mitigation Plan and urges all officials, employees, public and private organizations, and citizens, individually and collectively, to do their share in furthering the goals and objectives of hazard mitigation within the City of Big Bear Lake.

NOW, THEREFORE, THE CITY COUNCIL OF THE CITY OF BIG BEAR LAKE DOES HEREBY RESOLVE, DETERMINE AND ORDER AS FOLLOWS:

Section 1. Resolution No. 2012-04 is here by rescinded.

Section 2. The City Council approves the Local Hazard Mitigation Plan of the City of Big Bear Lake.

Section 3. The City Council authorizes the Director of Emergency Services to make necessary administrative and operational changes to the plan that are in keeping with the intent of the plan as approved.

Section 4. The City Council authorizes the Director of Emergency Services, or his duly appointed representative, to perform all duties required to carry out the Local Hazard Mitigation Plan.

Section 5. That the City Clerk shall certify to the passage and adoption of this resolution and enter it into the book of original resolutions.

PASSED, APPROVED and ADOPTED this XXth day of XXXXX, 2020.

AYES: NOES: ABSENT:

_____ _____

Date XXXX, Mayor

ATTEST:

_____

Erica Stephenson, City Clerk

Section 1 – Introduction

1.1 General Description

Emergencies and disasters cause death and/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.

This Local Hazard Mitigation Plan (LHMP)is a multi-jurisdictional plan developed jointly between the City of Big Bear Lake, the Big Bear City Community Services District, Big Bear Municipal Water District, and the Big Bear Fire Authority. This collaborative plan was developed to ensure that each participating agency has met the requirements of 44 CFR201.6.

The mission of the Local Hazard Mitigation Plan is to promote sound public policy designed to protect residents, visitors, critical facilities, infrastructure, key resources, private property and the environment from natural hazards throughout the Community Services District, Big Bear Fire Authority and City of Big Bear Lake service areas.

1.2 Purpose and Authority

The Disaster Mitigation Act of 2000 (DMA 2000), Section 322 (a-d) requires that local governments, as a condition of receiving federal disaster mitigation funds, have a mitigation plan that describes the process for identifying hazards, risks and vulnerabilities, identify and prioritize mitigation actions, encourage the development of local mitigation and provide technical support for those efforts. This mitigation plan serves to meet those requirements.

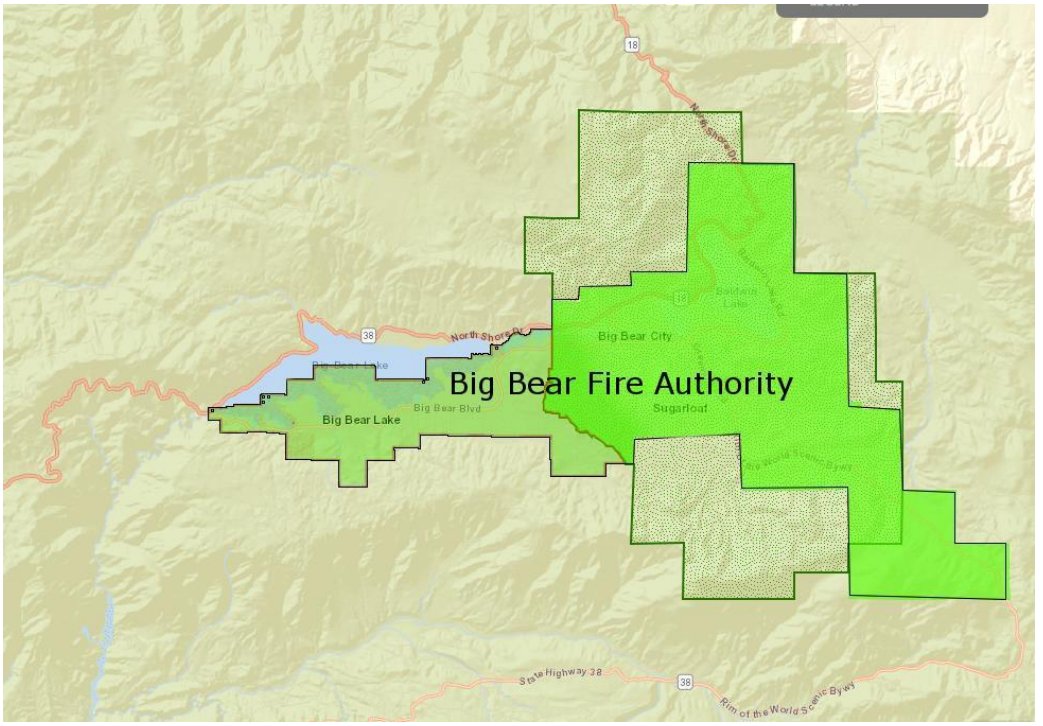
As a multi-jurisdictional plan, the document focuses on mitigating all-natural hazards impacting the City of Big Bear Lake and the Big Bear City Community Services District. The Big Bear Fire Authority provides fire suppression and prevention services to the City of Big Bear Lake and the Big Bear City Community Services District under a Joint Powers Authority. As a result, the fire mitigation strategies in this plan are inclusive of all areas served by the Big Bear Fire Authority. The Big Bear Municipal Water District has jurisdiction to regulate surface activities upon Big Bear Lake, regulate shoreline activities below the ordinary high waterline (OHWL), and operate the Bear Valley Dam which impounds Big Bear Lake. In addition to the local coordination of the review and update of this plan, hazard, risk and vulnerability assessment and mitigation strategy development for Big Bear Valley Community Service District areas and Big Bear Fire Authority areas outside of the City of Big Bear Lake's jurisdictional boundaries are included in the San Bernardino County Multi- Jurisdictional Hazard Mitigation Plan approved by FEMA on July 13,2017.

1.3 Community Information

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

1. Community Makeup and the Big Bear Fire Authority

   The City of Big Bear Lake and the Big Bear City Community Services District are independent governmental bodies, but conjoined jurisdictions, which collectively make up what is commonly known as the "Big Bear Valley". The two jurisdictions share many commonalities and would likely be mutually affected by any hazards and/or disasters. In 2012 a Joint Powers Authority was formed combining the Big Bear Lake Fire Department and the Big Bear City Community Services District Fire Department into one agency; the Big Bear Fire Authority. The Big Bear Fire Authority is charged with the protection of lives and property, prior to and during emergencies, and/or disaster conditions throughout the City of Big Bear Lake and the Big Bear City Community Services District jurisdictions.



2. Topography

The Big Bear Valley is located at an elevated mountain basin formed by the San Bernardino Mountains, with elevations ranging from 6,800 to 7,500 feet above mean sea level. The elevated surrounding terrain effectively isolates the greater Big Bear Basin from all but the coastal influences to the west. Distinguished by its high elevation, mild summers and winter snow, the Big Bear Valley is an important venue for winter sports and year- round recreation. Big Bear Lake is at the top of the Santa Ana Water Shed and is one of the headwaters of the watershed. Releases from Big Bear Lake are generally collected for use downstream in the Redlands and San Bernardino Valleys. Big Bear Lake is also the sink for all flood run off from the Big Bear Lake Water shed and when full, the dam is operated to control lake level and maintain flood control for residences and businesses which are near the OHWL.

2. Climate:

The Big Bear Valley enjoys an alpine climate and is located in an area that intercepts water-laden clouds, resulting in annual rainfall and/or snow of 20-35 inches, from the east end of the valley to the west, respectively. Precipitation at Big Bear Lake's National Weather Service station from 1960 to 1995 averaged about 18 inches for each six-month season from October to March. The coolest month of the year is January with a mean monthly temperature of 32.4 degrees Fahrenheit. The warmest month is July with a mean monthly temperature of 63.8 degrees Fahrenheit. The area's watershed is mountainous with steep upper slopes leading to a mildly sloping valley.

3. Watersheds/ Major Water Features:

Big Bear Valley's watershed is 72 square miles overall and is split between two sections: The Big Bear Lake Watershed (the western section) is 37 square miles and flows into Big Bear Lake and serves as headwaters of the Santa Ana River; and the Baldwin Lake Watershed (the eastern section) makes up the difference and flows into Baldwin Lake and eventually evaporates. If Baldwin Lake is full and heavy flood conditions occur, Baldwin Lake overflows through the airport area and drains into Big Bear Lake.

Big Bear Lake is a man-made reservoir, originally utilized to impound water for irrigation purposes in Redlands and the San Bernardino Valley. The Lake now serves as a major recreational facility of the Big Bear Valley, attracting millions of visitors each year. The Lake is the Northeastern head of the Santa Ana River and is the collection point for the Big Bear Lake Watershed within the Big Bear Valley. Big Bear

Lake is located adjacent to and north of the City boundary with a surface elevation of 6,743.25 feet above mean sea level (NGVD29). The Lake is approximately seven miles long with an average width of ½ mile and runs in an east to west direction. When full, it has a capacity of 73,320acrefeet. Its surface covers 2991 acres and there are 22 miles of shoreline.

4. Population/Demographics:

The City of Big Bear Lake has a population of approximately 5,269. Male population - 1,998
Female population – 2,164 Median age (years) - 42.8 Under 6 years - 318
6 years to 16 years – 789
16 years and over – 4,162

White - 3,530
Black or African American - 63 American Indian and Alaska Native - 58 Asian - 58
Some other race - 137
Hispanic or Latino (of any race) – 1,423

Average household size - 2.3
Average family size - 2.8
Total housing units 9,896
Occupied housing units - 2,250 Owner-occupied housing units - 1,238
Renter-occupied housing units – 1,012 Vacant housing units - 7,646

The Big Bear City Community Services District has a population of approximately 13,400.

Male population – 6,525 Female population – 6,875 Under 6 years – 1,031
6-16 years – 1,723
16 years and older – 10,658 Median age - 40

White –11,400
Hispanic or Latino – 1,680
All others -320

Average household size - 2.52 Average family size - 2.96 Total housing units - 9,240 Occupied housing units - 3,918 Owner occupied units - 2,917 Renter occupied units - 1,001 Vacation housing units -5,322

5. Economy:

In labor force (population 16 years and over) – 2,859

Average travel time to work in minutes (population 16 years and over) –22.55

Median household income (dollars) - 48,529
Median family income (dollars) - 60,060 Per capita income (dollars) - 29,251

Families below poverty - 179
Individuals below poverty level -796

The above-referenced data was obtained from U.S. Census Bureau “Fact Finder” 2013-2017 American Community Survey 5-Year Estimates and statistical information from the 2018 Southern California Association of Governments “Local Profiles Report 2019” specific to the City of Big Bear Lake.

6. Industry:

Tourism is the primary industry in the Big Bear Valley, creating full-time and part-time jobs for local residents. The San Bernardino Mountains play host to more than five million visitors annually. These visitors are predominantly part-time homeowners, friends, guests, and travelers from Southern California.

The most common industries / occupations are:

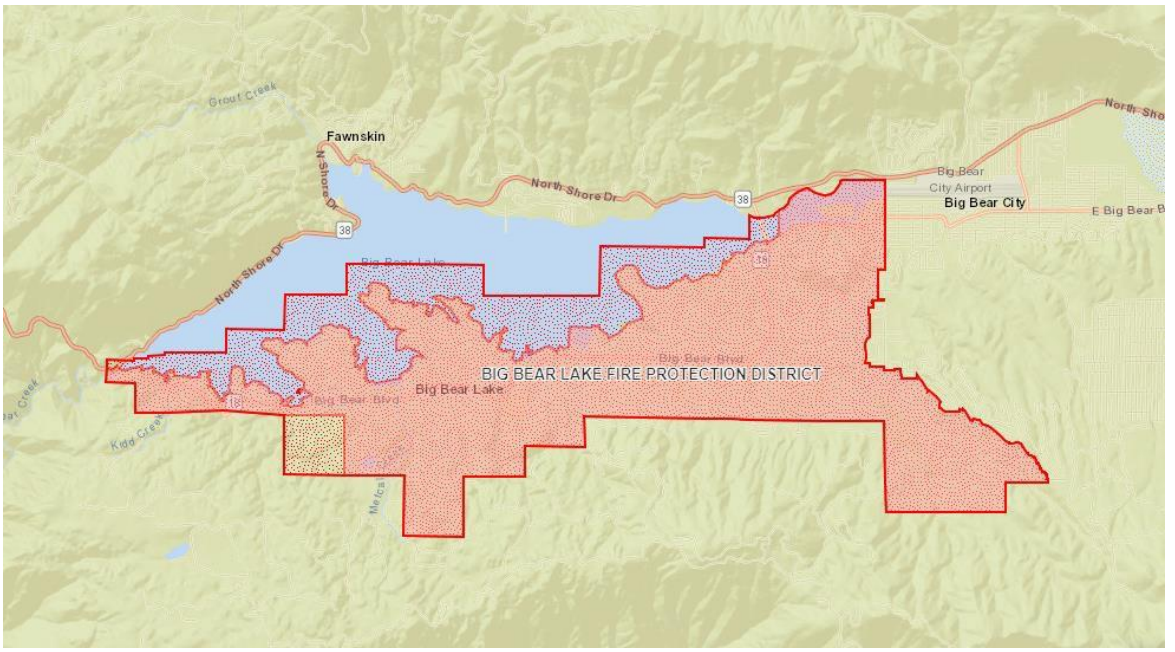
Males:
- Construction (19%)
- Accommodation and food services (18%)
- Public administration (9%)
- Educational services (7%)
- Arts, entertainment, and recreation (4%)
- Food and beverage stores (4%)
- Building material and garden equipment and supplies dealers (3%)

Females:
- Accommodation and food services (20%)
- Educational services (10%)
- Real estate and rental and leasing (9%)
- Health care (7%)
- Food and beverage stores (6%)
- Professional, scientific, and technical services (6%)
- Administrative and support and waste management services (5%)

1.4 Land Uses and Development Trends

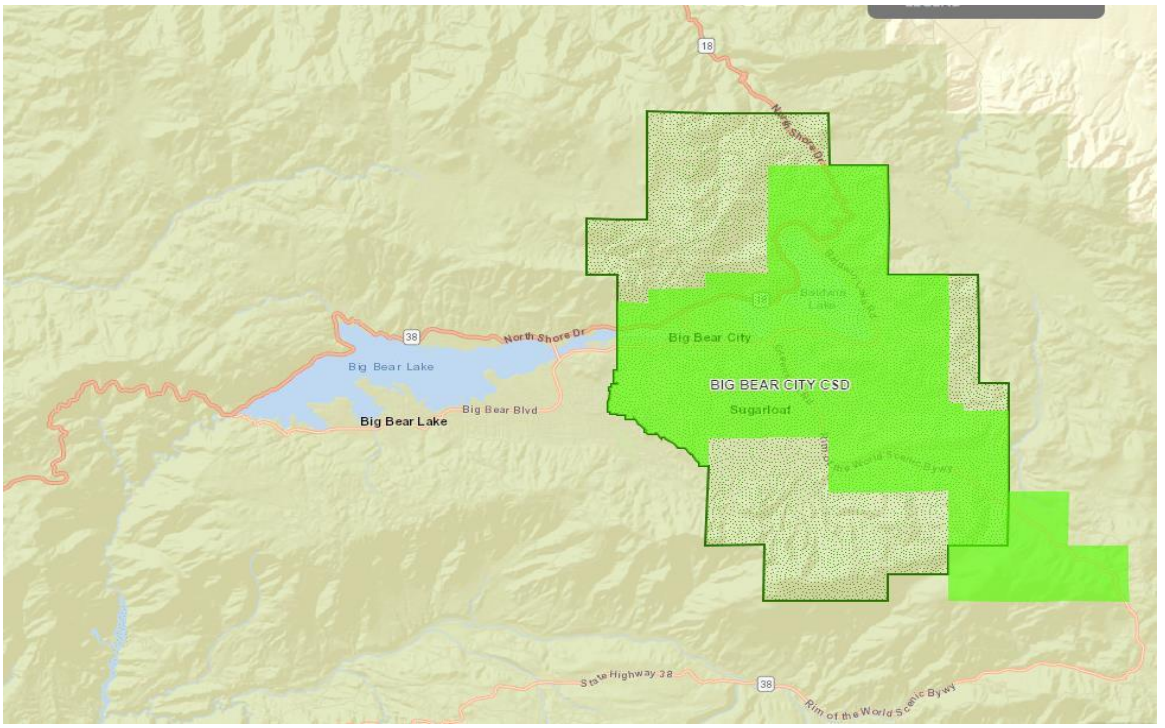
City of Big Bear Lake:

The City of Big Bear Lake encompasses approximately 7.0 square miles designated for a broad range of land uses, including residential, commercial, and industrial designations. 2,665 acres are zoned for single-family and multi-family development and 1,262acres are zoned for commercial, industrial, public space and open space use. Roads occupy 518 acres of the City area. Existing residential, commercial and industrial developments occupy approximately 75% of the acreage identified above. There are no undeveloped parcels that would allow for any type of large-scale development within the City. Future development will consist of small to moderately sized infill projects. Between 1990 and 2010, the City experienced a population growth rate of only 0.8%, ranking it 47th out of 48 cities in the Inland Empire. There have been no major changes in development within any of the four jurisdictions since 2010 that put the City at increased risk from hazard events. It is anticipated that the upcoming 2020 Census will identify a very similar to negligible population growth rate for the period from 2010 to 2020.



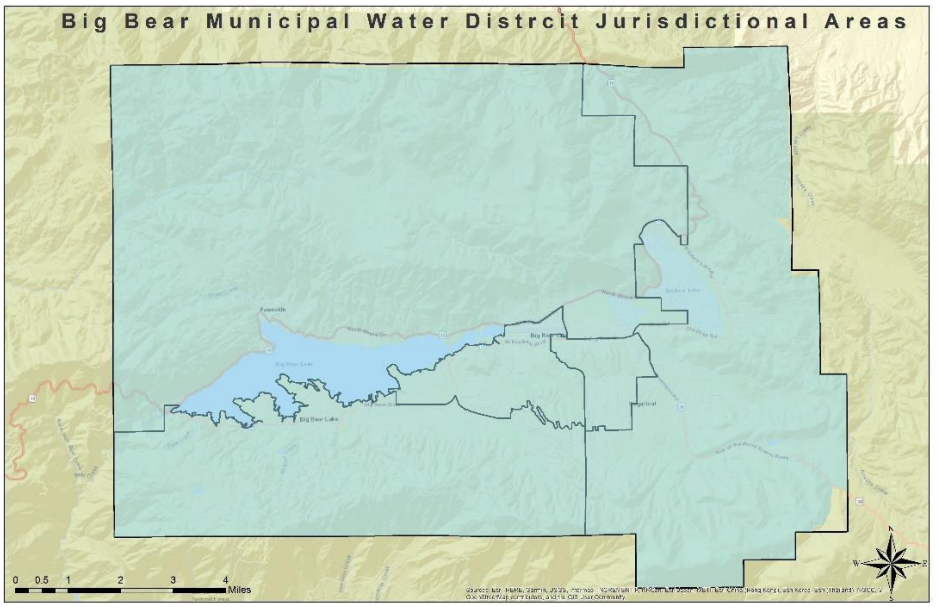
Big Bear City Community Services District:

The Big Bear City Community Services District encompasses 21.13 square miles that is bordered on the south, north and east by the San Bernardino National Forest, and bordered on the west by the City of Big Bear Lake. Approximately 85% is zoned for single-family and multi-family development and approximately 15% is zoned for commercial, industrial, public space and open space use. There have been no major changes in development within any of the District since 2010 that put the jurisdictions at increased risk from hazard events. Future development will likely consist of small to moderately sized projects.



Big Bear Municipal Water District:

The Big Bear Municipal Water District owns the land under Big Bear Lake and manages the recreational activities on the water's surface and shoreline. The Big Bear Municipal Water District was formed in 1964 by the voters of Big Bear Valley and the District's primary source of revenue is from property taxes throughout the Valley. The Lake has a capacity of 73,320-acre feet, 2991 surface acres, and 22 miles of shoreline. The District also owns and operates the Bear Valley Dam for flood control and water release purposes. The Bear Valley Dam Emergency Action Plan is located in Appendix J of this document. In conjunction with the Bear Valley Dam EAP, the District utilizes the Big Bear Lake Drawdown Plan (Appendix K) to plan lake releases based on predicted rain/snow storm information. The Big Bear Municipal Water District also manages invasive species programs to prevent the introduction of aquatic invasive species to Big Bear Lake. The Quagga/Zebra Mussel Prevention Plan is located in Appendix L. This is the first plan for the Water District so there are no changes.



Big Bear Fire Authority

This is the first plan for the Fire Authority so there are no changes.

Section 2 - Jurisdiction Information

2.1 Adoption by local governing body

Primary Point of Contact

The Point of Contact for information regarding this plan is:

Mike Maltby
Asst. Fire Chief –Fire Marshal
Big Bear Fire Authority
P.O. Box 2830
Big Bear Lake, CA 92315
(909)866-7566(Office)
mmaltby@bigbearfire.org

Phil Mosley–Retired during the plan review process
Director of Community Services/
Deputy Director of Emergency Services
P.O. Box 10000
Big Bear Lake, CA 92315
(909) 752-2892(Office)
pmosley@citybigbearlake.com

Promulgation Authority Information

This Hazard Mitigation Plan was reviewed and approved by the following Promulgation Authorities:
Big Bear Lake Fire Authority, Big Bear Community Services District, City of Big Bear Lake, and Big Bear Municipal Water District. All involved participants contributed to specific points related to the organizational function.

Contact Information:

Big Bear Fire Authority
P.O. Box 2830
Big Bear Lake, CA 92315
(909)866-7566

City of Big Bear Lake
P.O. Box 10000
Big Bear Lake, CA 92315
(909)866-5831

Fire Authority Board (ten members consisting of the Big Bear Lake City Council and the Big Bear City Community Services District Board of Supervisors)
Governing Board of the Big Bear Fire Authority
Description of Involvement*:* Plan review & approval Contact Information:
41090 Big Bear Boulevard
Big Bear Lake, CA 92315
(909) 866-7566

City of Big Bear Lake (Five-member City Council)
Description of Involvement*:* Plan review & approval
Contact Information:
39707 Big Bear Boulevard
Big Bear Lake, CA 92315
(909) 866-5831

Big Bear Municipal Water District (Five-Member Board) Description of Involvement*:* Plan editing, review, & approval Contact Information:
P.O. BOX 2863, 40524 Lakeview Dr. 39707 Big Bear Boulevard Big Bear Lake, CA 92315
(909) 866-5796

2.2 Multi-Jurisdictional plan adoption

Once all requisite State, and Federal approvals have been achieved, the Fire Authority's Hazard Mitigation Plan will be brought before the Big Bear Lake City Council, the Big Bear Community Services District Board, and the Big Bear Municipal Water District Board for adoption.

Section 3 - Planning Process Documentation and Public Involvement

3.1 Planning Team Member Information

This Hazard Mitigation Plan was reviewed, discussed and updated by members of the following Planning Team:

Phil Mosley, Director of Community Services/Deputy Director of Emergency Services – City of Big Bear Lake - Retired during the review process of this document. At that time, Mike Maltby, Big Bear Fire Department became the Primary Point of Contact

Contact Information:
City of Big Bear Lake
39707 Big Bear Boulevard
P. O. Box 10000
Big Bear Lake, CA 92315-8900
(909) 866-5831
pmosley@citybigbearlake.com

Mary Reeves
General Manager – Big Bear City Community Services District

Contact Information:
Big Bear City Community Services District
P. O. Box 558
Big Bear City, CA 92314
(909) 585-2565
mreeves@bbccsd.com

Mike Maltby–Primary Point of Contact
Assistant Fire Chief/Fire Marshal – Big Bear Fire Authority

Contact Information:
Big Bear Fire Authority
P.O. Box 2830
Big Bear Lake, CA 92315
(909) 866-7566
mmaltby@bigbearfire.org

Mike Stephenson
General Manager - Big Bear Municipal Water District

Contact Information
Big Bear Municipal Water District
P.O. BOX 2863
Big Bear Lake, CA
92315 (909) 866-5796
mstephenson@bbmwd.net

This Hazard Mitigation Plan also includes data and updated information provided during the review and discussion of this plan by a Big Bear Valley Multi-Jurisdictional/Agency Planning Team comprised of the following jurisdictions and agencies:

City of Big Bear Lake (Phil Mosley, Deputy Director of Emergency Services), Big Bear City Community Services District (Mary Reeves, General Manager), City of Big Bear Lake Department of Water and Power (Sierra Orr, Water Conservation and Public Information Supervisor), Bear Valley Unified School District (Shelli Black, Executive Assistant to the Superintendent), San Bernardino County Sheriff's Department (Lt. Ryan Collins), Big Bear Municipal Water District (Mike Stephenson, General Manager), Big Bear Valley Mountain Mutual Aid Association (General Membership and Board), Big Bear Airport District (Ryan Gross, Operations and Maintenance Manager), Southwest Gas Corp. Durst, Operations Supervisor), Bear Valley Electric Corporation (Paul Marconi, General Manager).NOTE: Phil Mosley retired from the City of Big Bear Lake during the review process of this document. Primary Point of Contact going forward will be Mike Maltby, Assistant Fire Chief.

All of the above-mentioned stakeholders were invited to participate in the planning and implementation of this multi- jurisdictional local hazard mitigation plan during the bi-monthly Mountain Mutual Aid Association that meets every other month. They were also provided the website location by e-mail with the draft LHMP to review.

This Hazard Mitigation Plan has been prepared following the inclusion by all included organizations (City of Big Bear Lake, Big Bear City CSD, Big Bear Fire Authority, Big Bear Municipal Water District) in multiple staff meetings, discussions, planning sessions to include the appropriate points, concerns, etc. during the preparation of this document. All involved participants contributed to specific points related to the organizations function.

3.2 Multi-Jurisdictional Planning Team Information

The Hazard Mitigation Plan update prepared by the County of San Bernardino Office of Emergency Services includes the Big Bear City Community Services District, Big Bear Municipal Water District, and Big Bear Fire Authority jurisdictional areas outside of the City of Big Bear Lake's jurisdictional boundaries. The County MJHMP update was approved by FEMA on July 13, 2017.

Contact Information:

San Bernardino County Fire Department, Office of Emergency
Services 1743 Miro Way
Rialto, CA 92376
(909) 356-3998

3.3 Public Involvement Items

Public Involvement consisted of the following items:

Big Bear Valley Mountain Mutual Aid
Association On-going Bi-Monthly Meetings

Topics of discussion included and will continue to include:

-On going hazard mitigation projects of the City, CSD, Fire Authority, MWD, County of San Bernardino and our local utility companies including the Big Bear Municipal Water District
-Disaster Mitigation Act of 2000 and mitigation project planning for compliance with this act
-Plan update process
-Public involvement
-Hazard identification
-Examples of existing mitigation efforts

BBVMMAA members (which include individual members of each of the Planning Team agencies identified in Section 3.1 above) in attendance at these bi-monthly meetings provide individual reports on the current status of the activities of their agency or organization. These reports include any response their agency or organization

provided in addressing a recent natural hazard event and input as to how effective existing mitigation measures were during the event and recommendation regarding implementing potential mitigation measures to address the natural hazard prior to a recurrence in the future. Copies of past meeting minutes attached as Appendix H.

Location:
Big Bear Fire Department Station 5/Valley Wide EOC

100 W. Meadow Lane
Big Bear City, CA
92314

Public Input

January 2020

Description:
This updated LHMP was posted on the City's website and public service announcements were made on our local radio station KBHR 93.3 requesting public review and comment. Additionally, public announcements were made regarding this update and posting of the draft document on the City's website at both City Council meetings in January 2020, which included requests for public input on the document.

Public comments requested through the Mountain Mutual Aid Organization, City of Big Bear Lake Website and local FM radio station KBHR. There were not any public comments received during the process for inclusion in review.

Section 3.4 Incorporation of Planning Elements

The planning team used many resources to develop this plan. Refer to Appendix Q for a list of resources and references and how they were used.

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.

A risk assessment is 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 community could be affected by a hazard, and the impact on community 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

The following table represents the Critical Priority Risk Index for each hazard facing the community.

Hazard	Probability	Magnitude/ Severity	Warning Time	Duration	Priority Risk Index
Wildfires	High Likely	Catastrophic	Less 6 Hours	More than one week	4
Infestation	High Likely	Catastrophic	24+ Hours	More than one week	3.55

Drought	High Likely	Critical	24+ Hours	More than one week	3.25
Earthquake	Likely	Critical	Less 6 Hours	Less than 6 hours	2.95
Winter Storms	Likely	Critical	12-24 Hours	Less than one week	2.85
Lightning	Likely	Limited	12-24 Hours	Less than 6 hours	2.8
Severe Thunderstorm	Likely	Limited	12-24 Hours	Less than 6 hours	2.8
High Winds/Straight Line Winds	Likely	Limited	12-24 Hours	Less than one week	2.55
Flooding	Possible	Limited	Less 6 Hours	Less than 6 hours	2.95
Flash Flooding	Possible	Limited	12-24 Hours	Less than 6 hours	1.9

The following is a list of each hazard/threat confronting the Big Bear Valley.

Natural Hazards

1. Drought

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 rain fall 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. A drought condition will affect 100% of all included jurisdictions in this plan.

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 local streams or on water levels in Big Bear Lake 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 State water allocations are cut or if wells and reservoirs go dry.

Description:
Seven years of drought (commencing in the 1999/2000 winter season) and exacerbated by the driest and warmest period in recorded history (January 2003) dramatically impacted large stands of trees in and around the City of Big Bear Lake. Drought is the predominant stressor, weakening trees and allowing pathogens such as Bark Beetles, root rot, and mistletoe to kill not only young trees, but old growth trees as well. Additionally, brush and chaparral have lower moisture content, contributing to a higher dead to live fuel ratios and mortality. Drought contributes to lower Lake levels directly affecting the recreational water level volume and water quality. This has a direct impact on the MWD. A full Lake level is 6,743.24 Feet Above Sea Level. This calculation is determined by the physical height of the Big Bear Dam. In the case of Drought determination, a Lake Level of 6,731.25 Feet Above Sea Level, or 12 Feet below full is the Drought determination height. As Lake level lowers, nutrients within the water column are concentrated. These concentrated nutrients can spur harmful algae blooms (HABs) which can be toxic to swimmers, pets, livestock, and fish and can heavily impact local economies. Lower lake levels also leave hundreds of acres of shore line exposed. Invasive terrestrial weeds and plants quickly populate

this exposed shoreline and can contribute to fire danger as they dry out in the fall months.

Historical Profile:
The San Bernardino Mountains are experiencing seven (7) years of drought. Precipitation was less than half of normal over this time period. Even though annual precipitation levels have been at or above normal over the past three winter seasons, the severity and duration of the previous drought conditions has resulted in lingering effects to trees and vegetation, which continues to provide for below normal fuel moisture in live fuels from spring through fall, increasing the fire hazard in this area. Approximately 350,000 acres in and around the San Bernardino National Forest have experienced significant mortality in timber and brush.

The Lake has seen increases in algae blooms during drought periods.

2. Earthquake

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, bridges, and dams; disrupt gas, electric, 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.


Highway 38 east of Barton Flats after the 1992 Big Bear Earthquake June 28, 1992

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 severe 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 City the Big Bear City Community Services District, the Big Bear Fire Department and the MWD are all in close proximity to several major earthquake faults. Earthquake conditions will affect 100% of all included jurisdictions within this plan. Refer to Appendix E for earthquake faults location descriptions and Appendix M for an earthquake fault map.

Historical Profile: Many major earthquakes, greater than 5.5 magnitude, have struck in Southern California since the mid 1800's: San Jacinto, April 21, 1918; Whittier Narrows, October 1987; Big Bear/Lander's, June 28, 1992; Northridge, January 17, 1994; and the Ridgecrest earthquakes, July 4 & 5, 2019.

All of the above-referenced earthquakes were in close proximity to the San Bernardino Mountain Range.

Refer to Appendix M for the Mercalli Scale, earthquake probability, and extent information.
https://msc.fema.gov/portal/search?AddressQuery

3. Flash Flooding

General Definition:
Flash flooding is a sudden flood of great volume, usually caused by a heavy rain. Flash floods are likely to occur within the major tributaries of Big Bear Valley including Rathbun Creek, Grout Creek, North Creek, Knickerbocker Creek, Summit Creek, Sawmill Creek, Van Dusen Canyon, and Shay Creek. However, flash flooding can be seen on streets where drainage is not adequate to control runoff. This can cause extensive damage to houses and businesses along these streets and tributaries. Flash flooding can cause roads to wash out, can put pedestrians in danger of drowning, can cause damage to homes, buildings, infrastructure, and economic impacts.

Historical Profile:
The City of Big Bear Lake and the CSD experienced isolated areas of flash flooding during a torrential rainfall incident on February 14, 2019.

The maps in Appendix O provide locations of both flooding and flash flooding.

4. Flooding

General Definition:
Floods are the most common and widespread of all-natural disasters--except fire. Most communities in the United States have experienced some kind of flooding, after spring rains, heavy thunderstorms, or winter snow thaws.

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 activity that prevents an emergency, reduce the chance of an emergency happening, or lessen the damaging effects of

unavoidable emergencies. Investing in mitigation steps now, such as, engaging in floodplain management activities, constructing barriers, such as levees, and purchasing flood insurance will help reduce the amount of structural damage to your home and financial loss from building and crop damage should a flood or flash flood occur.

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. The Bear Valley Dam is modeled to withstand a 100-year flood during an
8.0 earthquake. This equates to 1 foot of water cresting over the dam with all spillway gates and lower outlet works completely open.

Actually, there is little difference between a 100-year flood and what is known as the 10-year flood. Both terms are really estimates 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. Rod Bolin, The Ponca City News, July 18, 2002, Page 5-A.

Description:
There are low lying areas within the community that may be affected by runoff from flooding. Coupled with winter snow plugging culverts and runoff areas, areas have potential for flooding, especially if the snow turns to rain as temperatures increase. The area served by the Big Bear City CSD the functions of street maintenance, water runoff and flooding considerations managed by the San Bernardino County Public Works Department. Therefore, the Big Bear City CSD has limited exposure to risk in this section. Likewise, the MWD has responsibility only for lake management and appurtenant facilities, therefore limited exposure in this section.

Historical Profile:
Heavy rain years exceeding normal precipitation have contributed to flooding in the past. Additionally, thunderstorms which produce a significant amount of rain in a short period of time have also caused areas to flood. A flood condition will affect 100% of all included jurisdictions within this plan. Refer to Appendix E and Appendix O for flood zone maps.

5. High Winds/Straight Line Winds

General Definition:
High winds can result from thunderstorm in flow and out flow, or down burst winds when the storm cloud collapses, and can result from strong frontal systems, or gradient winds (high- or low-pressure systems) moving across the San Bernardino County mountain ranges. High winds are identified as having wind speeds reaching 50 mph or greater, either sustaining or gusting.

Historical Profile:
The Big Bear Valley experiences high wind episodes annually. These episodes have resulted in isolated instances of minor to severe structure damage and electric utility interruption caused by fallen trees. High Winds/Straight Line Wind conditions will affect 100% of all included jurisdictions within this plan.

6. Infestation

General Definition:
Damage and destruction caused by infestation of a natural organism. This hazard can include problems caused by insects, mollusks, weeds, 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.

The Gold Spotted Oak Borer (GSOB) has recently been identified as an invasive pest that has been seen in certain areas of Big Bear as of August 2019. This pest affects the Coast Live Oak, the California Black Oak, and Canyon Live Oak trees.

Historical Profile:
Bark Beetles are a part of nature; tree mortality from the Bark Beetle has been mild to moderate in the past. The impact of a 7-year drought resulted in nearly 100,000 acres of dead and dying trees within the San Bernardino National Forest, primarily due to Bark Beetle infestation. In conjunction with drought, years of "zero tolerance" fire prevention practices and extremely prohibitive tree removal regulations have led to overstocking of trees, which increased competition for severely limited water resources and thereby increased their vulnerability to infestation.

Quagga and zebra mussels are a threat to the waters of Big Bear Lake and the economy of Big Bear Valley. These fresh water mussels have rapidly infested hundreds of waterbodies in the United States and cost billions of dollars in damage to waterworks facilities. Preventing the spread of these mussels to Big Bear Lake is a top priority of the Big Bear Municipal Water District and over two million dollars has been spent by the District since 2008 to stop the spread of this invasive mollusk.

7. Lightning

General Definition:
Lightning is a discharge of atmospheric electricity, accompanied by a vivid flash of light, from a thunderstorm, frequently from one cloud to another, sometimes from a cloud to the earth. The sound produced by the electricity passing rapidly through the atmosphere causes thunder.

Within the thunderstorm clouds, rising and falling air causes turbulence, which results in a buildup of a static charge. The negative charges concentrate in the base of the cloud. Since like charges repel, some of the negative charges on the ground are pushed down away from the surface, leaving a net positive charge on the surface. Opposite charges attract, so the positive and negative charges are pulled toward each other.

This first, invisible stroke is called a stepped leader. As soon as the negative and positive parts of the stepped leader connect there is a conductive path from the cloud to the ground and the negative charges rush down it causing the visible stroke.

Thunder is caused by the extreme heat associated with a lightning flash. In less than a second, the air is heated to 15,000 to 60,000 degrees. When the air is heated to this temperature, it rapidly expands. When lightning strikes very close by, the sound will be a loud bang, crack or snap.

Thunder can typically be heard up to 10 miles away. During heavy rain and wind this distance will be less, but on quiet nights, when the storm is many miles away, thunder can be heard at longer distances. Lightning conditions will affect 100% of all included jurisdictions within this plan.

8. Severe Thunderstorm

General Definition:
A severe thunderstorm is an electrical storm, accompanied by heavy rain.

Historic Profile:

There is an annual potential for severe thunderstorm activity. Generally, the greatest potential for severe thunderstorm activity is during the time period of late July through late August. Severe thunderstorm conditions will affect 100% of all included jurisdictions within this plan.

9. Wildfires

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*:* Because the City is surrounded by National Forest, the threat of wildfire is of particular concern to the community.

Historical Profile: The San Bernardino Mountains have experienced numerous wildfires over the past two decades: Panorama Fire, 11/25/1980; Mill Fire, 09/01/1997; Willow Fire, 08/29/1999; Hemlock Fire, 06/14/2001; Arrowhead Fire, 06/14/2003; Bridge Fire, 09/05/2003, Old Fire, 10/25/2003, and the Slide Fire, 10/25/2007. Wildfire conditions will affect 100% of all included jurisdictions within this plan.

Location and Extent - Refer to Appendix N Fire Hazard Severity Zone map. Extent - Refer to Appendix N for Fire Hazard Severity Zone map.

10. Winter Storms

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 last 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 frost bite from windchill, and asphyxiation; house fires occur more frequently in the winter due to lack of proper safety precautions.

"Windchill" is a calculation of how cold it feels outside when the effects of temperature and windspeed 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.

Historic Profile:
During a 72-hour period commencing on the morning of January 20, 2010 and ending on the morning of January 23, 2010, a series of severe winter storm systems moved through the San Bernardino Mountains resulting in snow fall accumulation within the City ranging in depth from sixty inches (60") to seventy-two inches (72"). Numerous structural collapses occurred, numerous power outages occurred (some lasting up to 7 days), and the ability to replenish dwindling food and gasoline supplies became a concern due to severely restricted or impassable roads into, throughout and out of the City. A winter storm condition will affect 100% of all included jurisdictions within this plan.

4.2 Hazard Profile

The CPRI factors the elements of risk: Probability(P), Magnitude/Severity(M), Warning Time (WT) and Duration to create an index which allows for the prioritization of mitigation activities based on the level of risk. The following hazards are listed in order of decreasing CPRI score.

Definitions of probability
- Highly likely could be defined as 75% to 100% chance of occurring in a given, or happens every year.
- Likely could be defined as a 50% to 75% chance of occurring in a given year.
- Somewhat likely could be defined as a 25% to 50% chance of occurring in a given year.
- Possible could be defined as a 1% to 25% chance of occurring in a given year.

Natural Hazards

Drought

The San Bernardino Mountains has experienced two significant periods of drought in the past 20 years. The first being a seven-year period extending seven (7) years between 1998 and 2004 and the second being a five-year period extending between 2012 and 2017. Community impacts include restrictions on outdoor watering, limitations on the issuance of building permits, ramp closures and restricted access on the Lake, and a significant increase in tree mortality. Drought effects within the Big Bear City Community Services District area is addressed in 4.16 of the County of San Bernardino's MJHMP 2017 update.

Calculated Priority Risk Index (CPRI)

Probability: **4 Highly Likely** – There is an approximately 60% likelihood that a major drought will occur within the next 20 years, or one about every 10 years. This average may increase or decrease due to climate change.

Magnitude/Severity: **3Critical**

Warning Time: **1 24+ Hours**

Duration: **4 More than one week**

The CPRI for the Drought hazard for the Big Bear area is:

Probability + Magnitude/Severity + Warning Time + Duration = CPRI

4x .45 + **3** x.30 + **1**x .15 + **4** x .10 = **3.25**

Earthquake

The Big Bear area was impacted by two earthquakes on June 28, 1992. The Lander's Earthquake, centered 6 miles north of Yucca Valley, occurred at 4:57 am PDT and registered 7.3 on the Richter scale.

The Big Bear area was impacted by a second earthquake on June 28, 1992. The Big Bear Earthquake occurred at 8:05 am PDT, was centered 5 miles southeast of Big Bear Lake and registered 6.4 on the Richter scale.

While the July 4th and 5th 2019 Ridgecrest earthquakes garnered a significant amount of local attention, they did not generate significant ground motion in the Big Bear Area and did not result in any noticeable impacts within the Big Bear Valley.

Earthquake risk assessment information pertinent to the entire Big Bear Valley is provided in Section 4.13 of the County of San Bernardino MJHMP 2017 update.

Calculated Priority Risk Index (CPRI)

Probability: **3 Likely –** According to the California Earthquake Authority website earthquake risk tool San Bernardino County has a 75% likelihood of a 7.0 or larger earthquake in the next 30 years.

Magnitude/Severity: **3 Critical**

Warning Time: **4 Less 6 Hours**

Duration: **1 Less than 6 hours**

The CPRI for the Earthquake hazard for the Big Bear area is:

Probability + Magnitude/Severity + Warning Time + Duration = CPRI

3x .45 + **3** x.30 + **4**x .15 + **1** x .10 = **2.95**

Flash Flooding

The Big Bear Valley experiences flash flood events periodically, with a majority occurring in the summer months due to thunderstorm related activity.

- February 14, 2019 Affected areas within the City of Big Bear Lake and Big Bear City. While there was a significant amount of private property damage, the damage was minor to moderate in nature and did not result in the loss of any residential structure. The damage to public infrastructure was significant, resulting in over $250,000 in damage to roadways and sanitary sewer facilities. Additionally, a portion of State Highway 18 between Snow Valley and Green Valley Lake washed out and was impassable for several weeks. This resulted is some loss of local business revenue.

- July 12,2018 Affected areas within the City of Big Bear Lake and Big Bear City. There was minor property damage to public streets with a majority of the damage at low lying intersections and drainage termination points. Total property damage estimated at $500

- July 22, 2013 Affected areas within the City of Big Bear Lake and Big Bear City. A low-pressure system resulted in considerable flash flooding. Property damage was estimated at $200,000 to both private and public properties. There were no fatalities or injuries.

- July 5, 2011 Affected areas within the City of Big Bear Lake and Big Bear City. A strong high air pressure system aloft resulted and heavy rain and resultant storm water runoff throughout the Big Bear Valley. There were no reported property loss calculations prepared.

- August 17, 2007 Affected areas within the City of Big Bear Lake and Big Bear City. A thunderstorm stalled over the Big Bear Valley resulting in water and debris flows throughout the communities. There were no reported property loss calculations prepared.

- July 31, 2007 Affected areas within the City of Big Bear Lake and Big Bear City. A thunderstorm produced localized heavy rain and resultant water and debris flows. The heaviest reported repair efforts took place in the area of State Highway 38 and Mountain View. The California Department of Transportation (Caltrans) handled the debris removal. There were no reported property loss calculations prepared.

- July 22, 2005 Affected areas within the City of Big Bear Lake and Big Bear City. A thunderstorm system stalled over the Big Bear Valley resulting in hail and heavy rain throughout the communities. Runoff and debris flows occurred throughout the communities. There were no reported property loss calculations prepared.

- January 9, 2005 Affected areas within the City of Big Bear Lake and Big Bear City. A winter storm with temperatures above freezing resulted in heavy rain that resulted in flooding and debris flows. Snow fall from prior storms effectively forced the heavy rains to become channeled in areas not normally experiencing water flows. The resultant property damage to private and public property was approximately $1,025,000. There were no fatalities or injuries reported.

- August 14, 2004 Affected areas within the City of Big Bear Lake and Big Bear City. A thunderstorm resulted in heavy rain and debris flow throughout the Big Bear Valley. There were no reported property loss calculations prepared.

- August 24, 1999 Affected areas within the City of Big Bear Lake and Big Bear City. A thunderstorm resulted in heavy rain and debris flow throughout the Big Bear Valley. There were no reported property loss calculations prepared.

- July 13, 1999 Affected areas within the City of Big Bear Lake and Big Bear City. A thunderstorm resulted in heavy rain with resultant flooding and debris. Property loss to private and public property was estimated at $500,000.

- August 31, 1998 Affected areas within the City of Big Bear Lake and Big Bear City. A thunderstorm resulted in heavy rain and debris flows throughout the communities. There were no reported property loss calculations prepared.

Calculated Priority Risk Index (CPRI)

Probability: **2 Possible –** up to a 25% likelihood that major flash flooding can occur in a given year.

Magnitude/Severity: **2 Limited**

Warning Time: **1 Less than 6 Hours**

Duration: **1 Less than 6 hours**

The CPRI for the Flash Flooding hazard for the Big Bear area is:

Probability + Magnitude/Severity + Warning Time + Duration = CPRI

2x .45 + **2** x.30 + **2**x .15 + **1** x .10 = 2.95

Flooding

The City of Big Bear Lake experienced a single-day period of isolated flooding on January 11, 2005. A moderate snow event was immediately followed by a heavy rain event, which resulted in significant snow melt and storm water flows being redirected by snow and ice dams into areas that did not normally receive storm water flows. Significant damage to Menlo Drive occurred when storm water flows crossed over the street and resulted in the washout of the down sloping side of the roadway. The resulting mud-flow/subsidence left Menlo Drive impassable, one residential structure destroyed and four other residential structures significantly damaged. Additionally, storm water inundations of a number of residential and commercial buildings resulted in storm water damage in the minor to moderate range. Rough damage estimates put the recovery/reconstruction costs associated with this flooding event in excess of $3,000,000. Flooding in the Big Bear Community Service District area is addressed in Section 4.15 of the County of San Bernardino's MJHMP 2017 update.

Calculated Priority Risk Index (CPRI)

Probability: **2 Possible** – Refer to Appendix E and Appendix O for a flood zone maps which show 100-year and 500-year flood zones.

Magnitude/Severity: **2 Limited**

Warning Time: **2 12-24 Hours**

Duration: **1 Less than 6 hours**

The CPRI for the Flooding hazard for the Big Bear area is:

Probability + Magnitude/Severity + Warning Time + Duration = CPRI

2x .45 + **2** x.30 + **2**x .15 + **1** x .10 = **1.9**

High Winds/Straight Line Winds

Winter storm events generally produce strong winds that can gust as high as 80 miles per hour. General concerns relating to these wind events relate to interruption of electrical service and roadway obstruction due to fallen trees. The storm event of February 14, 2019 produced both significant rain fall and high winds. Several structures were significantly damaged by fallen trees during this event, resulting in estimated property and business losses exceeding $3,000,000. High wind events in the Big Bear Community Service District area are generally addressed in Section 4.9 of the County of San Bernardino's MJHMP 2017 update.

Calculated Priority Risk Index (CPRI)

Probability: **3 Likely -** Approximately 50% to 75% chance of major damaging windstorms occurring in a given year.

Magnitude/Severity: **2 Limited**

Warning Time: **2 12-24Hours**

Duration: **3 Less than one week**

The CPRI for the High Winds/Straight Line Winds hazard for the Big Bear area is: Probability + Magnitude/Severity + Warning Time + Duration = CPRI

3x .45 + **2** x.30 + **2**x .15 + **3** x .10 = **2.55**

Infestation

Various species of the "bark beetle" are always present within the City of Big Bear Lake and Big Bear City forest areas and the surrounding National Forest areas. Infestations of this parasite occur during extended drought periods and in densely treed areas where trees are stressed due to over competition for limited water resources. Pine tree mortality within the Big Bear Valley has been light to moderate during the past 20 years but has not resulted in a harmful decline in the Big Bear Valley tree population during this time period. Infestation events in the Big Bear Community Service District area are generally addressed in Section 4.9 of the County of San Bernardino's MJHMP 2017 update.

Calculated Priority Risk Index (CPRI)

Probability: **4 Highly Likely -** Approximately 75% to 100% chance of occurring in a given year.

Magnitude/Severity: **4 Catastrophic**

Warning Time: **1 24+ Hours**

Duration: **4 More than one week**

The CPRI for the Infestation hazard for the Big Bear area is:

Probability + Magnitude/Severity + Warning Time + Duration = CPRI

4x .45 + **4** x.30 + **1**x .15 + **4** x .10 = **3.55**

Wildfires

Holcomb Fire, *San Bernardino and east end of Big Bear City*, 6/19/17, originated northeast of Big Bear City, **Lake Fire**, San Bernardino National Forest, 6/17/15, started near Jenks Lake and heavily affected Highway 38, **Slide Fire**, San Bernardino National Forest 10/22/07, started near Butler Peak and forced evacuation of Big Bear Valley residents, **Old Fire**, *San Bernardino*, 10/25/03, originated ¼ mile north of Arrowhead Springs on Waterman Canyon Road; **Bridge Fire**, *Running Springs,* 09/05/03, broke out along the west side of State Highway 330; **Arrowhead Fire,** *San Bernardino,* 05/31/02, started next to Arrowhead Springs Hotel at the base of State Highway 18; **Hemlock Fire**, *Running Springs,* 06/14/2001, fire escaped from a prescribed burn on the south side of Running Springs and burned to the Keller Peak Fire Lookout Tower.; **Willow Fire**, *Lake Arrowhead,* 08/29/1999, fire made its way from Lake Arrowhead to Big Bear Valley in a matter of days; **Mill Fire**, *Running Springs, 09/01/1997; and the* **Panorama Fire**, *Crestline,11/25/1980.*

Note: The Valley Fire which originated on 7/6/18 did not impact the Big Bear Valley.

As witnessed by the number of events above and the devastating wildfires that ravaged Northern California in 2018 and 2019, wildfire poses the most significant risk to the Big Bear Valley.

Calculated Priority Risk Index (CPRI)

Probability: **4 Highly Likely –** Based on the number of wildfires that have occurred since 1980, there is a likelihood of a major wildfire to occur approximately every three years.

Magnitude/Severity: **4 Catastrophic**

Warning Time: **4 Less 6 Hours**

Duration: **4 More than one week**

The CPRI for the Wildfires hazard for the Big Bear area is:

Probability + Magnitude/Severity + Warning Time + Duration = CPRI

4x .45 + **4** x.30 + **4**x .15 + **4** x .10 = **4**

Winter Storms

Three winter storm events have resulted in significant impacts to the City of Big Bear Lake and to a slightly lesser degree the Big Bear City area. The impacts of the flash flood and flood events of 2019 and 2005 are described in those specific sections above. Additionally, the Big Bear Valley as a whole received anywhere from 60" to 72" of snow during a 72-hour period extending from January 13 to January 16, 2010. During this period, extreme measures were implemented to address issues associated with blocked roadways, downed power lines, and potential and actual structural collapse due to roof top snow accumulations. Costs associated with property/structure damage and emergency responses relating to this event exceeded $2,000,000.

Calculated Priority Risk Index (CPRI)

Probability: **3 Likely -** Approximately 50% to 75% chance of major damaging windstorms occurring in a given year. Magnitude/Severity: **3 Critical**

Warning Time: **2 12-24Hours**

Duration: **3 Less than one week**

The CPRI for the Winter Storms hazard for the Big Bear area is:

Probability + Magnitude/Severity + Warning Time + Duration = CPRI

3x .45 + **3** x.30 + **2**x .15 + **3** x .10 = **2.85**

Terrorism

As documented in Section 4.7.3 of the County of San Bernardino's MJHMP 2017 update, there have been two events identified as terrorist attacks in San Bernardino County. Neither of these events occurred within or near the Big Bear Valley. Due to our somewhat isolated location, limited access points, low population density and lack of significant terrorist targets (other than Bear Valley Dam), the probability of a terrorist attack within the Big Bear Valley is rated as extremely low.

Climate Change

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 can occur throughout all four jurisdictions.

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.

Probability: **4 Highly Likely -** Approximately 75% to 100% chance of occurring in a given year.

4.3 Vulnerability Assessment

4.3.1 Asset Inventory

4.3.1.1 Community Asset Overview

This section provides an overview of the assets in the Big Bear area.

Civic Center, 39707 Big Bear Boulevard, Phil Mosley (contact person), (909) 866-5831 (office), (909) 633-6428 (after hours)

Big Bear City Community Services District, 139 E. Big Bear Boulevard, Mary Reeves (contact person) (909) 585-2565

Department of Water and Power, 41972 Garstin Drive, Reggie Lamson (contact person), (909) 866-5050 (office), (909) 584-2962 (after hours)

Big Bear Municipal Water District, 40524 Lakeview Drive, Mike Stephenson (contact person), (909) 866-5796

Big Bear Fire Authority Headquarters/Station 281, 41090 Big Bear Boulevard, Jeff Willis (contact person), (909) 866- 7566 (office)

Big Bear Fire Authority Station 282, 301 W. Big Bear Boulevard, Jeff Willis (contact person), (909) 866-7566 (Station 281 office)

Big Bear Fire Authority Station 283, 550 N Maple Lane, Jeff Willis (contact person), (909) 866-7566 (Station 281 office)

Big Bear Fire Authority Station 284

Big Bear Lake Public Works Division, 42040 Garstin Drive, John Harris (contact person), (909) 866-6831 (office)

Big Bear City Community Services District, Paradise Maintenance Yard, 417 Grenfall Lane, Mary Reeves (contact person) (909) 585-2565

San Bernardino County Sheriff's Department, Big Bear Lake Division, 477 Summit Boulevard, Captain Mitch Dattilo (contact person), (909) 866-0100 (office), (909) 866-7581 (after hours, general public), (909) 356-3854 (after hours, supervisor only)

Bear Valley Community Hospital, 41870 Garstin Drive, John Friel (contact person), (909) 878-8247 (office)

Big Bear Recreation and Park District, 41220 Park Avenue, Reese Troublefield (contact person), (909) 866-9700 (office)

Big Bear City Airport, 501 W. Valley Blvd., Jack Roberts (contact person) (909) 585-3219

Bear Valley Unified School District, 42271 Moonridge Road, Shelly Black (contact person), (909) 866-4631 (office), (909) 878-3263 (after hours)

Big Bear Elementary School, 40940 Pennsylvania Avenue, Shelly Black (contact person), (909)866-4631(office), (909) 878-3263 (afterhours)

Big Bear Middle School, 41275 Big Bear Boulevard, Shelly Black (contact person), (909) 866-4631 (office), (909) 878- 3263 (after hours)

Big Bear High School, 351 N. Maple Lane, Sugarloaf, CA 92386, Shelly Black (contact person), (909) 866-4631(office), (909) 878-3263 (afterhours)

Baldwin Lane Elementary School, 44500 Baldwin Lane, Sugarloaf, CA 92386, Shelly Black (contact person), (909)866- 4631 (office), (909) 878-3263 (afterhours)

Bear Valley Electric, 42020 Garstin Drive, Paul Marconi (contact person), (909) 866-4678, extension 100 (office)

Chautauqua High School, 525 N. Maple Lane, Sugarloaf, CA, 92386, Shelly Black (contact person), (909) 866-4631 (office), (909) 878-3263 (after hours)

Southwest Gas Company, 40844 Big Bear Boulevard, Sam Pond (contact person), (760) 951-4030 (office), (800) 867-
9091 (after hours)

Big Bear Area Regional Wastewater Agency, 121 Palomino Drive, Big Bear City, David Lawrence contact person), (909) 684-4521 (office), (909) 585-3125 (after hours)

Big Bear Disposal, 41974 Garstin Drive, Steve Galante (contact person), (909) 866-3942 (office), (909) 709-6113 (after
hours), (909) 709-6113 (cell phone)

4.3.1.2 Critical Facility List

Civic Center, 39707 Big Bear Boulevard, Phil Mosley (contact person), (909) 866-5831 (office), (909) 633-6428 (after hours)

Facility Description: The Civic Center building containing the City Manager's Office, City Clerk's Office, Building & Safety Division, Code Compliance Division, Engineering Division, Film Office, Finance Division, MIS, Human Resources, Planning Division, and Performing Arts Center Auditorium.

Department of Water and Power, 41972 Garstin Drive, Reggie Lamson (contact person), (909) 866-5050 (office), (909) 584-2962 (after hours)

Facility Description: The Department of Water and Power provides domestic water service and fire flows to approximately 15,000 residential and commercial customers including the entire City of Big Bear Lake, Moonridge, Sugarloaf, the northern half of Erwin Lake, Lake Williams, Fawnskin, portions of Whispering Forest, and Rim Forest (near Lake Arrowhead. Key components of the water system include adequate source capacity (wells) and storage capacity (reservoirs) to meet peak holiday weekend demands; replacement of old leaky, undersized steel mainlines to provide adequate fire flow; and ongoing/recurring rehabilitation of older system components (buildings, reservoirs, pumps, motors, etc.) to assure reliable service.

Big Bear Municipal Water District, 40524 Lakeview Drive, Mike Stephenson (contact person), (909) 866-5796

Facility Description: The Big Bear Municipal Water District provides emergency services facilities in their Main Office Board Room. The facility has multiple phone lines and Wi-Fi internet capability with a 24-kW diesel generator. Because of its close proximity to lake access, patrol boats, and maintenance barges, the District Main Office would serve the best post for larger dive/rescue operations and salvage operations for lake related accidents like aircraft crashes or dam failures. The East and West Launch Ramps also serve as primary access to and from the Lake. Both Ramps can be used as landing sites for helicopters and launch points for rescue vessels.

Big Bear Lake itself is a reservoir and is a primary source of water during emergencies. Water may be drafted for firefighting and due to the east-west orientation of the lake, firefighting aircraft and helicopters can easily access the Lake’s waters.

Big Bear Fire Authority Headquarters/Station 281, 41090 Big Bear Boulevard, Jeff Willis (contact person), (909) 866- 7566

Facility Description: The Big Bear Fire Authority provides an all-risk/full-service organization which serves and protects the community through public education, fire prevention, fire suppression, emergency rescue, disaster preparedness, and other services in order to minimize the loss of life and property, damage to the environment, and adverse economic impacts due to natural or human-made emergencies or events. The District's boundaries currently incorporate approximately nine square miles with a current annual call volume of approximately 4,200.

Public Works Division, 42040 Garstin Drive, John Harris (contact person), (909) 866-5831 (office)

Facility Description: The Public Works Street Maintenance Division manages and maintains approximately 90 miles of roadway within the City limits and assures use of proper traffic control methods, proper signage, flow-lines, tree trimming, drainage, pothole repair, striping, snowplowing, and cindering.

The Public Works Village Maintenance District provides for street, sidewalk, and lighting improvements within the Village. Properties within district boundaries that specifically benefit from the improvements pay an annual assessment based on front footage. City staff maintains the lighting systems and overhead signs and provides maintenance and upkeep of the planters, including trees, shrubs, flowers, weed control, and the irrigation system in the Village. The Public Works Sanitation Division services 8,300 properties providing for the collection and transportation of

San Bernardino County Sheriff's Department, Big Bear Division, 477 Summit Boulevard, Captain Mitch Dattilo (contact person), (909) 866-0100 (office), (909) 866-7581 (after hours, general public), (909) 356-3854 (after hours, supervisor only)

Facility Description*:* The San Bernardino County Sheriff's Department provides for criminal law and traffic enforcement throughout the Big Bear area. The Sheriff's Department also provides all required administration, dispatch and clerical services. Specialized services such as homicide, narcotics, child crimes, aviation, crime lab, and crime prevention are provided. The Sheriff's Department maintains very robust volunteer forces, including Line Reserves, Search and Rescue, Horse Posse, and Citizens on Patrol.

Bear Valley Community Hospital, 41870 Garstin Drive, John Friel (contact person), 909.878.8247 (office)

Facility Description: Bear Valley Community Hospital maintains a 24-hour standby Emergency Department, Family Health Center, Laboratory, rural health clinic and skilled nursing facilities.

Bear Valley Unified School District, 42271 Moonridge Road, Shelly Black (contact person), (909) 866-4631 (office), (909) 878-3263 (after hours)

Big Bear Elementary School,40940 Pennsylvania Avenue, Shelly Black (contact person), (909)866-4631(office), (909) 878-3263 (afterhours)

Big Bear Middle School, 41275 Big Bear Boulevard, Shelly Black (contact person), (909) 866-4631 (office), (909) 878- 3263 (after hours)

Bear Valley Electric, 42020 Garstin Drive, Paul Marconi (contact person), (909) 866-4678, extension 100 (office)

Southwest Gas Company, 40844 Big Bear Boulevard, Sam Pond (contact person), (760) 951-4030 (office), (800) 867-
9091 (after hours)

Big Bear Area Regional Wastewater Agency, 121 Palomino Drive, Big Bear City, David Lawrence (contact person), (909) 684-4521 (office), (909) 585-3125 (after hours)

BBARWA Lake Interceptor System

Facility Description*:* The Lake Interceptor system conveys sewage from the City of Big Bear Lake to the Big Bear Area Water Agency treatment plant and consists of the Lake Pump Station and approximately 5.63 miles of 16-inch diameter force main. The Lake Interceptor force main is mostly ductile iron pipe with a small section of PVC pipe.

Big Bear Disposal, 41974 Garstin Drive, Steve Galante (contact person), 909.866.3942 (office), 909.709.6113 (after hours), 909.709.6113 (cell phone) - Refuse removal and hauling

Critical facilities within the Big Bear Community Services District:

Big Bear Fire Authority Station 282, 301 W. Big Bear Boulevard, Jeff Willis (contact person), (909) 866-7566 (Station 281 office)

Big Bear Fire Authority Station 283, 550 N Maple Lane, Jeff Willis (contact person), (909) 866-7566 (Station 281 office)

Big Bear City Community Services District, 139 E. Big Bear Boulevard, Mary Reeves (contact person) (909) 585- 2565

person) (909) 585-2565

BBARWA Treatment Plant, 122 Palomino Drive, David Lawrence (contact person), (909) 584-4018

Facility Description: The Big Bear Area Regional Wastewater Agency treatment plant is located in the community of Big Bear City and encompasses approximately 93.5 acres of land (approximately 11.2 acres for treatment plant and 82.3 acres for storage pond and lake evaporation). The BBARWA treatment plant is responsible for treating the sewage flow from surrounding member agencies as well as accepting the septic waste from those residents and businesses that are not connected or served by the existing sewer system

The treatment plant utilizes a biological treatment process (extended aeration activated sludge) with a biological treatment capacity of 4.89 MGD and a hydraulic capacity of 10 MGD. The treatment plant consists of the following unit processes and equipment:

-Preliminary treatment that includes a mechanical bar screen backed up by a redundant manual bar screen for removal of rags and large debris, and a grit removal system including an aerated grit chamber and grit washer.
-Secondary sedimentation consisting of two 75-foot diameter clarifiers and one 90-foot diameter clarifier.
-Two chlorine contact balancing chambers with a capacity of 500,000 gallons in each chamber.
-Effluent storage pond (Horseshoe Storage Pond) with a capacity of 5.25 MG.
-Effluent pumping stations including the main effluent pump station with a capacity of 5.2 MGD and an auxiliary pump station with a total effluent pumping capacity of 9.2 MGD.
-Emergency effluent storage pond with a capacity of 10 MG.
-Sludge processing, consisting of a dissolved air floatation sludge thickener and a belt filter press for sludge de-watering.

Big Bear High School, 351 N. Maple Lane, Sugarloaf, CA 92386, Shelly Black (contact person), (909) 866-4631 (office), (909) 878-3263 (after hours)

Baldwin Lane Elementary School, 44500 Baldwin Lane, Shelly Black (contact person), (909) 866-4631 (office), (909) 878-3263 (after hours)

4.3.1.3 Non-Critical Facility List

Not applicable

4.3.1.4 Individual Hazard Vulnerability Analysis

This section serves to identify each hazard confronting the community and its vulnerabilities to that hazard.

Natural Hazards

1. Drought

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

b. Critical Facilities.

(1) Approximately 100 percent of the community's critical facilities are vulnerable.

2. Earthquake

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

b. Critical Facilities.

(1) Approximately 100 percent of the community's critical facilities are vulnerable.

3. Flash Flooding

a. Population. Approximately 20 percent of the community's population is vulnerable.

b. Critical Facilities.

(1) Approximately 0 percent of the community's critical facilities are vulnerable.

4. Flooding

a. Population. Approximately 30 percent of the community's population is vulnerable.

b. Critical Facilities.

(1) Approximately 2 percent of the community's critical facilities are vulnerable.

(2) The specific critical facilities vulnerable in the Big Bear area are:

Big Bear Fire Authority, Station 281

City of Big Bear Lake Performing Arts/Civic

Center Verizon Microwave Station

Big Bear Municipal Water District Main

Office Bear Valley Dam

5. High Winds/Straight Line Winds

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

b. Critical Facilities.

(1) Approximately 100 percent of the community's critical facilities are vulnerable.

6. Infestation

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

b. Critical Facilities.

(1) Approximately 100 percent of the community's critical facilities are vulnerable.

7. Wildfires

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

b. Critical Facilities.

(1) Approximately 100 percent of the community's critical facilities are vulnerable.

8. Winter Storms

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

b. Critical Facilities.

(1) Approximately 100 percent of the community's critical facilities are vulnerable.

4.3.2 Potential Loss Estimation

4.3.2.1 Facility Replacement Cost Estimation

This section describes the replacement costs and economic impacts from lost facilities:

City Hall
Government Facilities
39707 Big Bear Boulevard
Facility Replacement Cost: $10,549,212

Public Works Division
Government Facilities
42040 Garstin Road
Facility Replacement Cost: $783,555

Big Bear Fire Authority
Fire Stations
281 - 41090 Big Bear Boulevard
282 - 301 W. Big Bear Boulevard
283 - 550 S. Maple Lane
284 -Lucky Baldwin Ranch Road
Facility Replacement Cost: $5,523,794

Department of Water and Power Water and Sewer
41972 Garstin Road
Facility Replacement Cost: $1,261,814

Big Bear City Community Services District
Government Facilities
139 E. Big Bear Boulevard
Facility Replacement Cost: $1,362,906

Paradise Maintenance Facility
Government Facilities
417 Grenfall Lane
Facility Replacement Cost: $4,046,997

Big Bear Municipal Water District
Main Office
40524 Lakeview Dr.
Big Bear Lake, CA 92315
Facility Replacement Cost: $5,200,000

Bear Valley Community Hospital
Emergency Medical Care Facilities
41870 Garstin Road
Facility Replacement Cost: Unknown

San Bernardino County Sheriff's Department,
Big Bear Division
477 Summit Boulevard
Facility Replacement Cost: Unknown

Big Bear Area Regional Wastewater Agency
Wastewater Treatment Facilities:
122 Palomino Drive
Facility Replacement Cost: Unknown

Replacement costs and economic impacts for lost facilities was gained from August 2018 CJPIA Property Insurance Program.

4.3.2.2 Individual Hazard Economic Loss Estimation

This section describes the potential losses due to each hazard confronting the community or jurisdiction. The Big Bear Valley is a geographically small area, 15 miles long, 2 miles wide. The impacts of this section will, in all likelihood, be felt by all four of the parties to this Hazard Mitigation Plan (City of Big Bear Lake, Big Bear City CSD, Big Bear Fire Department, Big Bear MWD). The Economic Loss Potentials and the Human Loss Potentials are inclusive.

Natural Hazards

1. Drought

Summary of Economic Losses

a. The economic loss resulting from this hazard is approximately $250,000 annually
b. The loss from damage to structures from this hazard is unknown
c. The following is a description of the estimated losses:
Cost of tree removal, planting of drought-resistant landscape, reduced sales tax revenues due to reduced lake level resulting in lower tourism numbers.

Estimated costs of damage and economic losses associated with severe and prolonged drought resulting in significant tree mortality and subsequent potential wildfire event are difficult to determine but would certainly be in the 100's of millions of dollars. If the drought is severe enough, the State Water Resources Department could call on water to be released from the Lake, which would impact local tourism and lake-based economies even further.

2. Earthquake

Summary of Economic Losses

a. The potential economic loss resulting from this hazard is unknown
b. The loss from damage to structures from this hazard is approximately $100,000,000
c. The following is a description of the estimated losses: Loss of critical facilities/equipment, relocation costs.

Estimated costs of damage and economic losses associated with a large magnitude earth quake event on the southern portion of the San Andreas fault are difficult to determine but would certainly be in the 100's of millions of dollars.

3. Flash Flooding/Flooding

Summary of Economic Losses

a. The economic loss resulting from this hazard is approximately $1,000,000
b. The loss from damage to structures from this hazard is approximately $2,500,000
c. The following is a description of the estimated losses:
Relocation costs, building and infrastructure repairs, business losses associated with obstructed/impassible roadways.

4. High Winds/Straight Line Winds

Summary of Economic Losses

a. The economic loss resulting from this hazard is approximately $500,000
b. The loss from damage to structures from this hazard is approximately $1,000,000
c. The following is a description of the estimated losses:
   Building and infrastructure repairs from fallen trees and loss of business due power outages.

5. Infestation

Summary of Economic Losses

a. The economic loss resulting from this hazard is approximately $50,000 - unknown
b. The loss from damage to structures from this hazard is approximately $75,000 annually
c. The following is a description of the estimated losses:
   Annual cost of tree removal, planting of pest-resistant plants/trees, maintaining outlet works, dock structures, and intake pipes (quagga mussel infestation).

Estimated costs of damage and economic losses associated with a severe bark beetle infestation resulting in significant tree mortality and subsequent potential wildfire event are difficult to determine but would certainly be in the 100's of millions of dollars. Quagga or zebra mussel infestation would cause a sharp increase in annual maintenance fees to remove quagga growth from pipes, gates, docks, and other appurtenant Lake structures. Longer term economic consequences of quagga/zebra mussel infestation include decrease in property values and decrease in sales tax/bed tax from decreased tourism rates.

6. Wildfires

Summary of Economic Losses

a. The economic loss resulting from this hazard is approximately $250,000
b. The loss from damage to structures from this hazard is approximately $75,000,000
c. The following is a description of the estimated losses:
   Loss of critical facilities/equipment, relocation costs, loss of tourism.

Estimated costs of damage and economic losses associated with a severe wildfire event, which may be amplified by significant tree mortality associated with a severe and prolonged drought event, are difficult to determine but would certainly be in the 100's of millions of dollars.

7. Winter Storms

Summary of Economic Losses

d. The economic loss resulting from this hazard is unknown
e. The loss from damage to structures from this hazard is approximately $1,250,000
f. The following is a description of the estimated losses:

Weather-related building repair, repair of damage to street, sewer, storm water and electric utility facility infrastructure. Economic loss is difficult to determine as tourism and related business revenue losses would be exacerbated by a prolonged event and interruption of travel to and within the Big Bear Valley.

4.3.2.3 Individual Hazard Human Loss Estimation

Natural Hazards

1. Drought

Summary of Human Losses

a. The estimated number of fatalities resulting from this hazard 0
b. The estimated number of injuries resulting from this hazard is 0
c. The estimated number of displaced persons resulting from this hazard is unknown
d. Total number of people affected is unknown
e. Percent of community's population at risk is unknown

While drought poses a significant threat to the tourism economy within the Big Bear Valley, this hazard does not pose an imminent threat to human life.

2. Earthquake

Summary of Human Losses

a. The estimated number of fatalities resulting from this hazard is unknown
b. The estimated number of injuries resulting from this hazard is unknown
c. The estimated number of displaced persons resulting from this hazard is unknown
d. Total number of people affected is unknown
e. Percent of community's population at risk: .0014%

The Magnitude 7.6 earthquake that occurred in June of 1992 on the Johnson Valley Fault and caused significant damage to older residential structures supported on post and pier foundation systems and to unreinforced masonry and rock fireplaces prevalent in the Big Bear Valley at that time. However, all of the structures located in the Big Bear Valley are lower-level structures with most in the one and two-story category and the balance not exceeding three stories in height. Additionally, this event occurred outside of peak tourism season. These factors resulted in the occurrence of few injuries and no deaths resulting from the 1992 quake. Time of year, time of day of an earthquake event present variable that make it impossible to estimate potential numbers of injuries and loss of human life in the event of the occurrence magnitude 7.7 earthquake on the North Frontal Fault Zone located approximately 7 miles to the north of the Big Bear Valley.

3. Flash Flooding/Flooding

Summary of Human Losses

a. The estimated number of fatalities resulting from this hazard is approximately 0
b. The estimated number of injuries resulting from this hazard is approximately 1
c. The estimated number of displaced persons resulting from this hazard is approximately 15
d. Total number of people affected: 255
e. Percent of community's population at risk: .01%

The February 14, 2019 winter storm event resulted in flooding of numerous residential structures within both the CSD and City of Big Bear Lake jurisdictions. 10 residents had to be temporarily relocated during the performance of flood damage restoration work. 5 residents were temporarily displaced during the January 11, 2005 flood and mud slide event.

The National Flood Insurance Program (NFIP) provides flood insurance to property owners, renters and businesses, and having this coverage helps them recover faster when floodwaters recede. The NFIP also

encourages communities to adopt and enforce floodplain management regulations that help mitigate the effects of flooding. Flood insurance is available to anyone living in one of the 23,000 participating NFIP communities. Homes and businesses in high-risk flood areas with mortgages from government-backed lenders are required to have flood insurance. Only Counties and municipalities are eligible for NFIP. Therefore, there are only records of repetitive flood insurance claims for those jurisdiction types. Refer to https://www.fema.gov/flood-insurance for more information.

As of 2018 the City of Big Bear Lake had 2 repetitive loss claims and no severe repetitive loss claims. This is the most current information the City is able to obtain.

The Big Bear Fire Authority, Big Bear City Community Services District, and Big Bear Municipal Water District are not eligible for NFIP and therefore have no repetitive or severe repetitive losses on record.

4. High Winds/Straight Line Winds

Summary of Human Losses

a. The estimated number of fatalities resulting from this hazard is approximately 0
b. The estimated number of injuries resulting from this hazard is approximately 0
c. The estimated number of displaced persons resulting from this hazard is approximately 0
d. Total number of people affected: 0
e. Percent of community's population at risk: 0%

While high wind events have resulted in various occurrences of structural damage to residences and commercial buildings and electric utility lines from fallen trees, no injuries or loss of human life has been reported in direct association with a wind event.

5. Infestation

Summary of Human Losses

a. The estimated number of fatalities resulting from this hazard is approximately 0
b. The estimated number of injuries resulting from this hazard is approximately 0
c. The estimated number of displaced persons resulting from this hazard is approximately 0
d. Total number of people affected: 0
e. Percent of community's population at risk: 0%

There have been no reported injuries or loss of human life in association with this hazard.

6. Wildfires

Summary of Human Losses

a. The estimated number of fatalities resulting from this hazard is approximately 0
b. The estimated number of injuries resulting from this hazard is approximately 1
c. The estimated number of displaced persons resulting from this hazard is approximately 14
d. Total number of people affected: 15
e. Percent of community's population at risk: .0003%

While there have been a significant number of wildfires that have threatened the Big Bear Valley, none of these wildfires has made a significant intrusion into the Valley, resulting in only one reported wildfire related injury and no reported human fatalities.

7. Winter Storms

Summary of Human Losses

a. The estimated number of fatalities resulting from this hazard is approximately 0
b. The estimated number of injuries resulting from this hazard is approximately 3
c. The estimated number of displaced persons resulting from this hazard is approximately 0
d. Total number of people affected: 3
e. Percent of community's population at risk: .0006%

During the winter snow storm of January 2010, three injuries were reported in association with the storm. None of the injuries were critical in nature and no fatalities were reported as a result of this event.

4.3.3 Analysis of Community Development Trends

4.3.3.1 Development History

This section describes the development history for both the City of Big Bear Lake and the Big Bear Community Services District (collectively the "Big Bear Valley").

Development History*:*

Big Bear Lake and the surrounding communities were historically natural resource sources for the populations of the valleys at the base of the San Bernardino Mountains. The Big Bear Valley has experienced mining, cattle ranching, and forestry "booms" at one time or another. In recent times, the Big Bear Valley has been a weekend and second-home retreat for residents of the San Bernardino, Riverside, and Los Angeles metropolitan areas primarily a result of ski resort visits in the winter months and lake use in the summer months. The communities surrounding the lake have traditionally been small and rural and, until recently, did not experience the challenges of urbanization faced by other cities in the Inland Empire.

In recent years, as tourism increased, the impacts of these visitors began to be felt by permanent residents. The residents of the Big Bear Valley expressed a strong desire to balance the benefits of growth with the preservation of the natural environment.

There are currently 4,466 acres in the planning area (nearly seven square miles), designated for a broad range of land uses, including residential, commercial, and industrial designations.

Future Development:

There are currently 9240 residential housing units within the City of Big Bear Lake, with a potential of 2,162 future housing units being developed.

There are 729 acres of commercial property within the City and 2028 acres of commercial property within the CSD with approximately 70 acres remaining to be developed.

Unique local characteristics of the Big Bear Valley as a whole have resulted in the development of County of San Bernardino and City of Big Bear Lake general plan and development code provisions that encourage tourism based, low hazard low-rise commercial and retail businesses. Residential development has and is anticipated to continue to consist of low-rise single-family and multi-family structures.

4.4 Multi-Jurisdictional Risk Assessment

The jurisdictional areas of the Big Bear Fire Authority, Big Bear City Community Services District, Big Bear Municipal Water District, and the City of Big Bear Lake fully comprise the Big Bear Valley as a whole and have equal exposure to the natural hazard identified in this plan. Accordingly, the risk assessment identified in this plan applies equally to these four jurisdictions. Additional risk assessment information pertaining to these

identified natural hazards in the Big Bear Community Services District and Big Bear Municipal Water District jurisdictional area can be found in the County of San Bernardino's MJHMP 2017 update.

Section 5 – Mitigation Strategy

The City, Big Bear Fire Authority, Big Bear Municipal Water District, and the CSD work closely together in sharing information and ideas generated from past natural hazard events within the Big Bear Valley. Information and idea sharing occurs during direct interagency contacts and also at bi-monthly meetings of the Big Bear Valley Mountain Mutual Aid Association (BBVMMAA). BBVMMAA meeting agendas and meeting minutes for 2019 are attached as Appendix H. This cooperative effort extends to developing General Plan, Development Code, Building Code and Fire Code requirements aimed at mitigating the potential impacts of the natural hazards common to the Big Bear Valley. This objective is identified in Section 5.1 of the County of San Bernardino's MJHMP 2017 update.

5.1 Community Capability Assessment

The State of California recommends that the General Plan be updated every 10 to 20 years. The City of Big Bear Lake last updated its General Plan and Development Code in 2003. Both the City's General Plan and Development Code will be updated in 2020 and 2021 respectively. Environmental hazards identified in both this plan and the Environmental Hazards Element (Appendix E attached hereto) of the City's General Plan will be reviewed and updated as appropriate and reference to the updated MJHMP will be included in the City's General Plan update. As identified in Section 5.1.1 of the County of San Bernardino's MJHMP 2017 update, the County Board of Supervisors adopted their 2017 MJHMP as a part of their General Plan. In addition to the General Plan Elements, the City's Development Code contains requirements that specifically identify mitigation measures for the natural hazards identified in this plan. Specific review of and reference to this MJHMP will be included in the City's 2021 Development Code update.

5.1.1 Existing Plans, Policies, and Ordinances

This section describes the existing plans, policies, and ordinances for the Big Bear Fire Authority, City of Big Bear Lake, Big Bear City Community Services District, and Big Bear Municipal Water District. In addition to the General Plan and Development Code requirements discussed above, the City of Big Bear Lake works closely with the Big Bear Fire Authority, Big Bear City Community Services District, and Big Bear Municipal Water District in the development, modification and review of building, fire, property maintenance standards and codes that assist in our ability to uniformly develop and implement hazard mitigation measures and strategies across the Big Bear Valley.

Big Bear Fire Authority:

- Adoption of 2016 California Fire Code (Ordinance Number BFA 2017-001)
- Adoption of the 2018 Community Wildfire Protection Plan
- Fire Fuel Reduction Requirements (Native Brush and Shrub Ordinance Number BFA 2017-001 Sec.49)

City of Big Bear Lake (City Ordinances can be viewed and downloaded at https://library.municode.com/ca/big_bear_lake/codes/code_of_ordinances?nodeId=ORLIDITA:

- City of Big Bear Lake Development Code (Ordinance Number 2003-333)
- Procedures for Tree Conservation within the City (Ordinance Number 2002-325)
- Fire Hazard Abatement (Ordinance Number 95-263)
- Approval, Inspection, and Conditions of Operation for Transient Private Home Rentals (Ordinance

Number 99- 300) (Amended by Ordinance 2007-375)
- Regulating Slope Density (Ordinance NO. 90-191) (Amended by Ordinance NO. 2005-345)
- Outdoor Fire Permit Requirements (Ordinance Number FP2006-12)
- Wood Shake/Shingle Abatement (Ordinance Number FP2007-13)
- Adoption of 2019 California Fire Code (Ordinance Number 2019-475)
- Adoption of the 2019 Building Standards Code, 2019 California Mechanical Code, 2019 California Plumbing Code, 2019 International Property Maintenance Code, 2019 California Existing Building Code, 2019 California Electrical Code, 2019 California Energy Code, 2019 California Historical Building Code, 2019 California Reference Standards Code
- Fire Fuel Reduction Requirements (Native Brush and Shrub Ordinance Number 2008-379)
- Flood Damage Prevention (Ordinance Number 2009-397)
- Sanitary Sewer Restaurant Discharge Requirements (Ordinance Number 2009-398)
- Storm Water Management Ordinances: Yes
- Stream Management Ordinances: Yes
- Zoning Management Ordinances: Yes
- Subdivision Management Ordinances: Yes
- Erosion Management Ordinances: Yes
- Floodplain Management Ordinances: Yes
- Floodplain Management Plan Published Date:8/28/2008
- Floodplain Management Last Delineation Date:2009
- Elevation Certificates Maintained: Yes
- National Flood Insurance Program Community: Yes
- National Flood Insurance Join Date:3/07/1989
- NFPI Number: 060731
- Land Use Plan: Yes
- Land Use Plan Last Update: 2017
- Community Zoned: Yes
- Zoned Date: 2003
- Established Building Codes: Yes
- Building Codes Last Updated: 2019
- Type of Building Code: California Building Code
- Local Electric Utilities: Bear Valley Electric
- Local Water Utilities: City of Big Bear Lake Department of Water and Power and the Big Bear City Community Services District
- Local Sewage Treatment Utilities: Big Bear Area Regional Wastewater Agency
- Local Natural Gas Utilities: Southwest Gas
- Local Telephone Utilities: Verizon
- Fire Insurance Rating: After analyzing the structure fire suppression delivery system provided by Big Bear fire Authority, the Insurance Services Office issued a classification of 3.
- Fire Insurance Rating Date:2/26/2016
- Previous Mitigation Plans:2012
- Flood Insurance Claims:

Unknown Big Bear City Community

Services District:

- Adoption of the 2016 California Fire Code (Ordinance Number BFA2017-001)
- District Emergency Operations Plan
- Water System Emergency Response Plan
- Water System Master Plan
- Sewer System Management Plan
- Spill Prevention Control & Countermeasure Plan
- Storm Water Pollution Prevention Plan
- Business Emergency Contingency Plan Big Bear Municipal Water District
- Bear Valley Dam Emergency Action Plan
- Big Bear Lake Drawdown Plan
- BBMWD Quagga Prevention Plan

Other regulations involving hazard mitigation have been established at the San Bernardino County level as identified in the County's MJHMP 2017 update.

All of the participating jurisdictions can expand/improve and integrate these capabilities for mitigation activities.

5.1.2 Prior and Continuing Mitigation Actions and Projects

This section serves to identify previous and ongoing mitigation plans, projects and actions. The City of Big Bear Lake, Big Bear Fire Authority and Big Bear Community Services District will continue to work cooperatively together and with the membership of the Big Bear Valley Mountain Mutual Aid Association to review and refine hazard mitigation strategies and project planning throughout the Big Bear Valley. This cooperative hazard mitigation effort will include joint communication and sharing of information relating to availability of Hazard Mitigation Grant Program funding that is or may become available.

Natural Hazards

1. Drought

A. Complete - The Department of Water and Power implemented a community education program regarding water conservation. The DWP works closely with City staff in the review and monitoring of new and existing developments for compliance with State of California mandates of the Model Water Efficiency Landscape Ordinance.

B. Complete-The number of water meters was restricted for new construction within the Big Bear Valley during the severe drought period of 1998 through 2004. Additional water well drilling and water storage tank projects have been completed in the past 5 years to significantly increase and improve water delivery and storage capabilities. The DWP continues to monitor existing system delivery facilities and has developed and implemented a capital improvement program that has greatly reduced system loss through the replacement of significant portions of defective and deficient system components.

C. Complete - The Department of Water and Power has signage posted throughout the community, reminding citizens about the importance of water conservation.

D. Ongoing-The City of Big Bear Lake, Big Bear City Community Services District, Big Bear Municipal Water District, Big Bear Area Regional Waste Water Agency, and Big Bear Lake Department of Water and Power have formed a Groundwater Sustainability Agency (GSA) which has produced a Groundwater Sustainability Plan. The GSA is working on developing a wastewater treatment and recharge program that has the potential to significantly enhance the Big Bear Valley's ability to sustain water resources throughout an extended drought period. The Big Bear Area Regional Waste Water Agency is the lead agency involved in this effort.

2. Earthquake

A. Ongoing - Earthquake preparedness education is provided at the local elementary school each year. All students in the school participated in the program.

B. Ongoing – Fliers on earthquake preparedness have been made available at the San Bernardino County Public Library, Big Bear Lake Branch, in addition to City Hall and the Big Bear Fire Authority.

C. Complete - The Building & Safety Division performed evaluations of un-reinforced masonry construction and there are no remaining unreinforced masonry structures remaining within the City of Big Bear Lake. The County of San Bernardino has complied with all State of California mandated mitigation requirements within the Big Bear Community Service District.

D. Complete - The City of Big Bear Lake and the County of San Bernardino have adopted the 2019 California

Building Codes, which include the latest seismic design and construction standards.

E. Ongoing - Southwest Gas provides natural gas service to customers throughout the Big Bear Valley. Over the past 5 years Southwest gas has replaced over 68 miles of gas main and services in efforts to provide a natural gas supply system that is more resilient and reliable even after the occurrence of a major seismic event. In addition, over the next 5 years, Southwest Gas will be replacing 2.4 miles of high-pressure gas lines, building a new regulator station and replacing an existing regulator stations in the Big Bear Valley.

F. Ongoing - Big Bear City Community Services District and The City of Big Bear Lake adopted the latest building standards to comply with the new building codes. Current local building and fire codes are on a three-year cycle and will make amendments based on the international codes. Once the international amendments are published, local amendments are then published and adopted.

G. Complete - The Big Bear Municipal Water District has an Emergency Action Plan (EAP) in place for Bear Valley Dam to evaluate the dam structure after any earthquake above a 3.0 magnitude. The EAP lists evaluation strategies and guidelines, produces a local agency contact list based on the level of disaster, and gives remedies and actions based on the level of disaster at the dam. The EAP is located in Appendix J.

3. Flash Flooding/Flooding

A. Ongoing - The Public Works Division has and continues to clean and maintain flood control channels and natural drainage areas within the City of Big Bear Lake. The Big Bear City Community Services District's flood control channels and natural drainage areas are monitored and maintained by the County of San Bernardino Flood Control District and has established flood mitigation projects as identified in Section 5.1.3.4 of the County of San Bernardino's MJHMP 2017 update.

B. Ongoing - The Big Bear Fire Authority has made information available to community members on mitigation measure that can be taken regarding flooding.

C. Ongoing – Both the County of San Bernardino and City of Big Bear Lake have identified FEMA designated flood zones within the Big Bear Valley and have adopted flood plain management ordinance that are compliant with FEMA floodplain regulations. All new developments and proposed additions to existing developments within the Big Bear Valley are reviewed for compliance with the National Flood Insurance Program and flood plain management regulations of the County of San Bernardino's or City of Big Bear Lake's Development Services staff.

The Big Bear Fire Authority, Big Bear City Community Services District, and Big Bear Municipal Water District are not eligible for the National Flood Insurance Program.

D. Ongoing-The City of Big Bear Lake is working cooperatively with the County of San Bernardino, CALFIRE, the National Forest Service and state and local trails organizations to plan and develop a comprehensive trail system throughout the Big Bear Valley. In many instances these trails abut existing drainage channels and floodways. As these specific trail projects are developed, flood plain management strategies will be reviewed and flood mitigation measures will be incorporated into the trail design and construction. Trail planning and design staff will review current and proposed Hazard Mitigation Program Grant Funding opportunities as a standard practice within the trail planning and development process.

E. Complete - The Big Bear Municipal Water District's Bear Valley Dam EAP (Appendix J) contains guidelines to minimize and mitigate potential loss of life and damages around the Lake's shoreline and downstream in the event of a dam rupture and subsequent flash flood. The Big Bear Municipal Water District also drafted and utilizes the Big Bear Lake Drawdown Plan to prevent flooding of low-lying areas around the lake and near tributaries by releasing water before a large rain or snow event hits the Big Bear Valley. The Big Bear Lake Drawdown Plan is located in Appendix K.

F. Complete - Thrush Drive from Comstock to Big Bear Boulevard – Installation of a debris basin. Installed new

underground pipe from Comstock to Big Bear Boulevard and various catch basins (Engineering Division. Completed in 2006 for the total project cost of $2,030,029.02

G. Complete - Park Avenue, west of Summit Boulevard – Upsized culverts and raised the road (Engineering Division). Cost: $380,000 Completed in 2007 City of Big Bear Lake.

H. Complete - Meadow Park – Installed catch basins at Park Avenue and new pipe to channel at the back of the park (Engineering Division). Cost $255,000 Completed in 2013 City of Big Bear Lake.

I. Complete - Knickerbocker Road at Maryland Road – Installed new catch basins at the corner of Knickerbocker Road and Maryland Drive, new 48" pipe across to Knickerbocker Creek (Engineering Division). Cost: $262,000 Completed in 2011. City of Big Bear Lake.

J. Complete - Pine Knot Avenue and Cameron Drive – Install new underground pipe of Cameron Drive from Ironwood to Pine Knot Avenue. Install curb and gutter at the north side of Cameron Drive and new catch basins on Pine Knot Avenue (Engineering Division). Cost: $454,000 Completed in 2007 City of Big Bear Lake.

K. Complete - Lakeview Drive and Big Bear Boulevard – Upsized culvert crossing Big Bear Boulevard at Lakeview Drive (210'). Constructed new concrete channel through existing lodge and upsize culverts at Lakeview Drive (Engineering Division). Cost: $239,000 Completed in 2015 City of Big Bear Lake.

L. Complete - Big Bear Boulevard at Tulip Lane – Upsize existing culvert, raise road to increase capacity (Engineering Division). Estimated cost: $78,000 Completed in 2006 City of Big Bear Lake.

M. Complete - Park Avenue, west of Summit Boulevard – Upsized culverts and raised the road (Engineering Division). Cost: $380,000 Completed in 2007 City of Big Bear Lake.

N. Complete - The Big Bear Municipal Water District's Big Bear Lake Drawdown Plan contains a weather prediction model that is continuously refined with the latest forecast data. This model helps the District better predict weather patterns and provides refined time-frames for Lake draw-down in the event of a forecasted heavy rain or flood scenario.

O. Complete - 42268 Moonridge Road - Deepen existing channel line with concrete (350'). Line existing channel with rip rap (500'). Complete miscellaneous grading improvements (Engineering Division). Cost: $105,000 Completed in 2018. Big Bear Lake

5. High Winds/Straight Line Winds

A. Ongoing - The Bear Valley Electric Company is currently in the second year of a 5-year $12,200,000 dangerous tree removal or trimming project. This capital improvement project is designed to identify and remove trees or portions of trees that have the potential to damage power lines during high wind events. This program also includes the identification and replacement or remediation of damaged/deteriorating power poles that may fail during a high wind event. In 2019, this program resulted in the removal of 167 dangerous trees, the trimming of 10,904 trees, the replacement of 425 power poles and the remediation of 101 power poles with minor damage. This project is 28% complete.

B. Ongoing - The Bear Valley Electric Company is currently in the second year of a 5-year $3,600,000 tree attachment removal project. This operations and maintenance project is designed to identify and remove power line attachments to trees and mitigate damage to the power line in the event significant tree movement or toppling during a high wind event. In 2019, 273 power line tree attachments were removed. This project is 22% complete.

C. Complete - The City of Big Bear Lake and the County of San Bernardino have adopted the 2019 California Building Codes, which include the latest wind design and construction standards. These wind design standards are applied to all new development projects and additions to existing development projects throughout the Big

Bear Valley.

D. Ongoing – The Big Bear Fire Authority developed and implemented a "Hazardous Tree Removal Program" and applied for and received Pre-Disaster Hazard Mitigation Grant Program funding for this project. Since 2017, this program has been responsible for the removal of 102 hazardous trees that could have caused significant property damage or personal injury or human death if toppled during a high wind event. This is an on-going program and the Big Bear Fire Authority is continuously applying for additional Pre-Disaster Hazard Mitigation Program Grant funding in the planned continuation of this program.

E. Complete - Bear Valley Electric has completed the first year of two five-year hazard mitigation programs totaling 15.8 million dollars. These mitigation programs are designed to minimize power outages throughout the Big Bear Valley caused by hazardous trees, tree branches and power line tree attachments that result in damage to power lines during high wind events.

6. Infestation

A. Ongoing – The Big Bear Fire Authority developed and implemented a "Hazardous Tree Removal Program" and applied for and received Pre-Disaster Hazard Mitigation Grant Program funding for this project. The majority of these trees died as a result of bark beetle infestation. This program is designed to mitigate the dangers poses by standing dead trees and minimize bark beetle infestation spread through the treatment and removal of infested trees. Since 2017, this program has been responsible for the removal of 102 hazardous trees that could have contributed to the significant expansion of a bark beetle infestation within the Big Bear Valley. This is an on-going program and the Big Bear Fire Authority is continuously applying for additional Pre-Disaster Hazard Mitigation Program Grant funding in the planned continuation of this program.

B. Ongoing – The Big Bear Fire Authority has worked closely with the Mountain Area Safety Task Force in promoting "Fire Safe" communities across the San Bernardino Mountains. Section 5.1.3.1 of the County of San Bernardino's MJHMP 2017 update provides additional detail regarding this multiple agency public outreach effort.

C. Complete - The Big Bear Municipal Water District implemented a Quagga/Zebra Mussel Prevention Plan in 2008 to prevent the spread of quagga/zebra mussels and other invasive species into the waters of Big Bear Lake. This is a living document and is updated each year. It contains best management practices, strategies, and policies to help prevent the spread of all aquatic invasive species into Big Bear Lake. The plan includes the following protocols: vessel inspection, vessel decontamination, vessel quarantine, containment, monitoring, and education. The plan also includes a vulnerability assessment and economic risk assessment. The Quagga/Zebra Mussel Prevention Plan is located in Appendix L.

7. Wildfires

A. Ongoing – Hundreds of dead/hazard trees have been removed through a cooperative effort between citizens, Big Bear Fire Authority, San Bernardino County, Bear Valley Electric, the Natural Resource Conservation Service (NRCS), and CALFIRE. The Big Bear Fire Authority developed and implemented a "Hazardous Tree Removal Program" and applied for and received Pre-Disaster Hazard Mitigation Grant Program funding for this project. Since 2017, this program has been responsible for the removal of 102 hazardous trees that could have added significant fire fuel to a wildfire event. This is an on-going program and the Big Bear Fire Authority is currently applying for additional Pre-Disaster Hazard Mitigation Program Grant funding in the planned continuation of this program.

B. Ongoing - The Big Bear Fire Authority continuously seeks grant funding opportunities to support the Healthy Urban Forest Initiative.

C. Ongoing - The multi-jurisdictional Big Bear Valley Community Wildfire Protection Plan (CWPP) was recently updated by the Big Bear Fire Authority and promulgates measures to reduce the risks associated with wildfire. The Big Bear Valley CWPP will be used to apply for grant funds for vegetation removal (dead and live

fuels).

D. Ongoing - The Big Bear Fire Authority has applied for and received Pre-disaster Hazard Mitigation Program Grant funding for the past decade for significant funding of its Big Bear Chipping Program. This program was designed and implemented to remove forest fuel waste generated during private property owner property maintenance operations

Conducted in creating defensible space. This wild fire hazard mitigation program is ongoing and has resulted in the removal of 5,008 cubic tons of forest fuel biomass material.

E. Ongoing - The City of Big Bear Lake and the County of San Bernardino have adopted the 2019 California Building Codes, which include the latest urban wildlife interface property maintenance and fire resistive construction standards. These property maintenance and fire resistive construction design standards are applied to all new development projects and additions to existing development projects throughout the Big Bear Valley.

F. Ongoing - Big Bear City Community Services District and The City of Big Bear Lake adopted the latest building standards to comply with the new building codes. Current local building and fire codes are on a three-year cycle and will make amendments based on the international codes. Once the international amendments are published, local amendments are then published and adopted.

G. Ongoing - The Big Bear Municipal Water District works closely with the United States Forest Service to close sections of the Lake during forest fires to allow helicopter dipping operations and water scooping aircraft to access the Lake. The District's Lake Patrol boats set up perimeters to keep recreational boaters and other people/watercraft from interfering with firefighting aircraft operations.

H. Complete - The Big Bear Fire Authority, the City of Big Bear Lake and the County of San Bernardino have adopted ordinances requiring fire fuels reduction for the creation of enhanced defensible space around structures.

8. Winter Storms

A. Ongoing - Brochures on winter storm preparedness are displayed annually during winter season at the Big Bear Lake Fire Protection District, San Bernardino County Public Library, Big Bear Branch, the Big Bear Community Services District and at the City of Big Bear Lake Civic Center.

B. Ongoing - Public service announcements are made on both television and radio broadcasts, advising the community of winter storm forecasts.

C. Ongoing - The Big Bear Municipal Water District makes preventing lake ice related accidents a top priority. Lake ice is common in the winter months and never gets thick enough to safely support a person, vehicle, or other recreational equipment. Traveling onto lake ice is against the law. People who venture onto lake ice not only endanger their own lives but also jeopardize the lives of rescuers. The Big Bear Municipal Water District makes radio broadcasts, posts signage and posts social media blasts relating to the dangers of walking or recreating on lake ice in an attempt to prevent accidents. The District and/or SB County Sherriff's Department may also fine violators.

9. Climate Change

A. Ongoing - Extreme weather events, whether short period or extended duration periods of extreme heat or excessive cold, have the potential to generate environmental conditions that create or exacerbate most of the natural hazards identified in this plan. The City of Big Bear Lake, the Big Bear Fire Authority, the Community Services District, and Big Bear Municipal Water District will continue to work with the San Bernardino County Office of Emergency Services in the local in implementation of extreme heat and extreme cold programs as generally identified in Section 5.1.3.5 of the County of San Bernardino's MJHMP 2017update.

10. Terrorism

A. As identified previously, the likelihood of the occurrence of a terrorism event within the Big Bear Valley is extremely low due to limited population density, Valley remoteness and limited access points, and the lack of high-profile targets. We would work with the support of the San Bernardino County Office of Emergency Services in developing need resources and a response plan to a specific terrorism event. This hazard is identified in the County of San Bernardino's MJHMP 2017update.

B. Complete - The Big Bear Municipal Water District's Bear Valley Dam EAP (Appendix J) addresses potential terrorist threats to the Bear Valley Dam. In order to mitigate threats, the District has installed security cameras and added fencing and barbed wire to previously accessible areas.

5.1.3 Technical and Fiscal Resources

This section describes the technical and fiscal resources for City of Big Bear Lake and the Big Bear City Community Services District.

1. FINANCIAL RESOURCES

The Big Bear City Community Services District has a total 2020-2021 fiscal year budget of $11,564,104, which is predominately utilized to provide their service area with clean and safe potable water, solid waste collection and disposal and waste water collection and disposal. The Big Bear Fire Authority has 2020-2021 fiscal year budget of
$5,506,100, all of which is utilized to provide fire suppression and medical aid services within the Big Bear Valley. The City of Big Bear Lake has a 2020-2021 fiscal year budget of $15,326,020, most of which is utilized to provide general services, development services, law enforcement services and capital improvement project construction and maintenance. The Big Bear City Community Services District relies on the County of San Bernardino for development and implementation of hazard mitigation strategies and programs as defined in the County's MJHMP 2017 update. The Big Bear Fire Authority relies exclusively heavily on Pre-disaster Hazard Mitigation Program and other grant funding in the implementation of its hazard mitigation programs. A significant portion of the City of Big Bear Lake's annual budget can be attributed directly to implementing identified hazard mitigation actions through consistent application of General Plan, Development Code, Building Code and Fire Code and other development standards to proposed new developments and additions to existing developments. The Big Bear Municipal Water District has spent over 2 million dollars since 2008 on aquatic invasive species prevention and receives between 200,000 and 400,000 each year in grant money to further increase aquatic invasive species prevention activities and infrastructure. The District has numerous unencumbered funds that can be re-allocated to mitigation activities including the dam repair fund for earthquake and flood damages, the Grout Creek restoration, and Lake Improvement fund.

2. TECHNICAL RESOURCES

Description: Through the evaluation of flood plain maps, seismic maps, mutual aid agreements, The City of Big Bear Lake, Big Bear City Community Services District, and Big Bear Municipal Water District will continue to create/modify community plans to prepare for natural hazards. Other technical resources will be pursued as necessary to gain necessary data. The Big Bear Fire Authority, City of Big Bear Lake, the Big Bear City Community Services, and the Big Bear Municipal Water District are committed to work together in conjunction with the Big Bear Valley Mountain Mutual Aid Association during any disaster occurrence that has valley wide impacts. Technical resources applicable to the Big Bear City Community Services District are identified in the County of San Bernardino's MJHMP 2017 update.

3. **OUTREACH AND EDUCATION RESOURCES** – All four jurisdictions coordinate and participate in the following outreach activities. These resources can be further expanded to include additional hazards.
   - Firewise Community Program
   - Chipping program for local homes
   - Hazardous debris removal program
   - Annual property inspections for hazard abatement
   - Publications for citizens on vegetation management and Firewise Planting Guide for protecting homes.
   - Flood and earthquake safety bulletins

5.2 Mitigation Goals

Goals and objectives discussed in this section help describe what actions should occur, using increasingly narrow descriptors. Long Term Goals are developed which can be accomplished by objectives. To achieve the stated objectives "mitigation actions" provide specific measurable descriptions on how to accomplish the objective. The goals, objectives, and actions form the basis for the development of Mitigation Action Strategy and specific mitigation projects to be considered for implementation. The process consists of 1) setting goals and objectives, 2) considering mitigation alternatives, 3) identifying strategies or "actions", and 4) developing a prioritized action plan resulting in a mitigation strategy.

The following section provides an overview of the Mitigation Goals and Objectives for the 10 profiled hazards in Section
5.1.2 above. These hazards and goals were identified in the of City of Big Bear Lake's previous Local Hazard Mitigation Plan and the County of San Bernardino's MJHMP 2017 update.

These documents were reviewed by our planning team, which resulted in the elimination of previously identified Lightning and Thunderstorm Hazards and the addition of Climate Change and Terrorism Hazards. Lightning and Thunderstorm Hazards were removed as a mitigation strategy not already addressed by uniform application of Development Code and Building Code design and construction requirements. Climate Change and Terrorism Hazards were added to address FEMA HMPG hazard analysis requirements.

Planning Area Goals – All the participating jurisdictions used these planning goals to develop their mitigation strategies:
- All Hazards - Increase readiness for all hazards.
- Wildfire - Continue to reduce fire hazards.
- Earthquake - Minimize exposure to structural and contents damage from geologic and seismic conditions.
- Flood - Provide adequate flood protection to minimize hazards and structural damage.
- Drought - Minimize the effects of drought on the planning area in all aspects including economically and socially.
- Terrorism - Use antiterrorism strategies to discourage terrorism and protect the people, infrastructure and assets from the effects of terrorism.
- Climate Change - Reduce the impacts of climate change and limit human activities that change the atmosphere's makeup.
- Protect human lives and safety.

5.3 Mitigation Actions/Projects

This section serves to list previously identified mitigation projects, project status and the planning team's evaluation of projects value to Big Bear Valley by hazard.

<u>Natural Hazards</u>

1. Drought (High Priority)

A. New - A groundwater recharge feasibility study was completed. This study identified that direct groundwater

recharge was not financially feasible due to local geographic factors and other factors. However, the Big Bear Area Regional Wastewater Agency (BBARWA) is pursuing grant funding to pursue a Baldwin Lake and Big Bear Lake recharge project.

B. New - Water demand offset program. New developments are encouraged to offset estimated water demand by installing efficient appliances/fixtures (assists in ensuring future water supply) (Department of Water and Power). All four participating jurisdictions will collaborate on this activity.

2. Earthquake (High Priority)

A. Continue - Annual valley wide public education efforts. Estimated cost: $250 per year. The planning team identified that earthquake preparedness public awareness programs are effective and critical to keeping valley residents prepared to protect themselves during and sustain themselves after a major earthquake event. All four participating jurisdictions will coordinate these efforts.

3. Flash Flooding/Flooding

City of Big Bear Lake:

B. Not Started-Swan Drive, east of Oriole–Deepen channel and lined with concrete (300') (Engineering Division). Cost: $66,000 Project not constructed yet. Planning team has identified this is a lower priority project at this time. 1-3 years

C. New - Willow Landing Road at Tayles Point Road – Construct new concrete channel between the properties (Engineering Division). Estimated cost: $45,000 Project not constructed at this time. Planning team identified this as a low priority project.

D. New - Rathbun Creek Improvement Project – this floodway extends from Big Bear Lake to the upper Moonridge area. Numerous projects are in the preliminary planning stages for construction projects that will be completed over the next decade. 1-3years

E. Ongoing - The City will continue to evaluate the adequacy of flood control facilities in order to identify improvement projects that are appropriate and necessary in mitigating flood hazards.

Big Bear City Community Services District:

Typical areas of flooding within the District are located in the central portion of the valley in normal drainage areas. Beginning with the east in of the District and moving west, the following areas are subject to moderate to severe flooding. The district does not manage storm water or flooding. San Bernardino County Flood Control manages these issues on the District's behalf so this plan has no mitigation actions at this time. Refer to the County flood plan for information.

A. New - Teal Drive north of Big Bear Blvd: Flooding in this area impacts multiple cross streets and several hundred residential structures. 1-3years

B. New - Drake Avenue north of Big Bear Blvd: Flooding in this area impacts multiple cross streets and approximately fifty structures. 1-3years

C. New - Sawmill Canyon from Sugarloaf Blvd to the airport: Flooding in this area impacts the main thoroughfare of Big Bear Blvd, Fire Station 282, multiple side streets and approximately 50 other structures 1-3years

D. New-Pineview Drive from Raleigh Drive to the airport property: Flooding impacts all residences on Pineview, causing major access issues and potentially disrupting emergency services. Flooding also impacts Big Bear Blvd, several side streets, and several hundred structures. 1-3years

E. New - Gildart Drive from Sugarloaf Blvd to the airport property: Flooding impacts multiple side streets and several hundred structures. 1-3years

F. New - Greenway Drive and Paradise Way: Flooding flows east / west on these two streets as the local drainage channels overflow, stopping traffic on both streets. 1-3years

G. New - Baldwin Lake also has the potential to flood during 100-year flood conditions. Examples of mitigation actions for localized flooding: Storm-water management planning and polices, improving storm- water drainage system capacity, conducting regular maintenance for drainage systems and flood control structures, flood-proofing structures, elevate or retrofit structures and utilities, protect critical facilities, construct flood control measures, flood risk assessment, establish local funding mechanisms for flood mitigation, remove existing structures from flood hazard areas, increase awareness of flood risk and safety, and educate property owners about flood mitigation techniques.

H. The Big Bear City Community Services District will work with the San Bernardino County Flood Control District to continue mitigation efforts in these identified flood prone areas.

Big Bear Municipal Water District:

Typical areas of flooding can occur in low lying areas 0-5' feet above the Lake's OHWL.

4. High Winds/Straight Line Winds

A. New - Improve public awareness of severe wind through outreach activities. This will be coordinated by all three jurisdictions. Ongoing.

B. New - Coordinate with Bear Valley Electric to relocate power and utility lines underground. This will be coordinated by all participating jurisdictions. 1-3years.

C. New - Improve public awareness of wildfire danger. This will be coordinated by all participating jurisdictions will be ongoing.

5. Infestation

A. Ongoing - The Big Bear Lake Fire Authority will continue its hazardous tree removal program designed to remove bark beetle infested trees and thereby reduce the chances for a greater infestation issue.

B. Ongoing infrastructure, training, and activities related to aquatic invasive species prevention. The annual average the District spends on their invasive species prevention program is over $2 million dollars. The Big Bear Municipal Water District has procured permits from the California Department of Fish and Wildlife to remove terrestrial invasive plant species and aquatic invasive root structures from dry portions of the shoreline between the OHWL and the current water line. This project is known as "Clear and Grub". The Clear and Grub project reduces invasive species on the shoreline, therefore opening land for re-population of native and beneficial species. By reducing invasive terrestrial weeds along the shoreline, wildfire threat is also reduced. The Clear and Grub project not only removed terrestrial invasive species but also removes the first foot of nutrient rich dry

lakebed sediment. By removing this top one foot of dry lakebed sediment, viable aquatic root crowns and structures of aquatic invasive species are removed which helps to prevent the re-growth of Eurasian Water Milfoil, the Lake's most abundant aquatic invasive plans species. Furthermore, removing the top foot of nutrient rich dry lakebed inherently removes nutrients - - primarily phosphorus and nitrogen) which react with the water column when the lake is full. Algae thrives on phosphorus and nitrogen and by removing this nutrient rich top foot of sediment, algae growth is limited. This method can help prevent harmful algae blooms.

6. Wildfires (High Priority)

The Big Bear Fire Authority's Defensible Space Project proposal includes:

AA. Continue - A public education campaign, in coordination with the Big Bear Fire Authority, Big Bear Valley Fire Safe Council, City of Big Bear Lake, Big Bear City Community Services District, and San Bernardino County, to educate and ask property owners to create defensible space at each property in the Valley. This project is ongoing.

B.B New - Offer all property owners a free on-site evaluation by staff from the Big Bear Fire Authority in order to promote the creation of individual defensible space for their property. This opportunity will be continued through the community's public education campaign. Ongoing

C.C Continue - The Big Bear Fire Authority, City of Big Bear Lake and the Big Bear City Community Services District will continue to give top priority to programs and activities that promote the creation of defensible space throughout the community. This includes the continuation of outreach efforts to property owners to create defensible space throughout the community. This project is ongoing.

E.E New - Adoption of enhanced mutual aid agreements, resulting in an improved response to wildfire incidents and valley-wide emergency hazard response. 1-3 years.

Big Bear Municipal Water District:

A. The District coordinates with the forest service during wildfires to coordinate dipping operations for firefighting aircraft to ensure perimeters are maintained to keep the lake recreators and aircraft safe. The MWD is a lake management organization and does not have any wildfire Mitigation measures or responsibilities.

7. Winter Storms

A.A New - The severe winter storm occurrences in recent years had identified the community's need to develop or refine transportation, rescue, and sheltering plans during severe winter storm events, purchase generators, and provide public education about winter storms. All participating jurisdictions will pursue these actions. 1-3 years

BB. New - All participating jurisdictions are cooperating with the Sherriff's Department to increase winter patrol and ticketing of people who venture onto lake ice. Additional signage, infographics, news media, and social media posts aim to educate and curb the number of people who venture onto lake ice. Ongoing during winter months.

5.4 Implementation Strategy and Analysis of Mitigation Projects

The Big Bear Fire Authority, City of Big Bear Lake, Big Bear City Community Services District, and Big Bear Municipal Water District will continue to work together with all local agencies, utility companies and support groups in completing existing mitigation projects and in identifying and implementing new hazard mitigation

projects as identified. Historically, the most significant events negatively impacting the Big Bear Valley were, drought, wild fires, earthquake and flooding adjacent to local streams and storm water channels. Mitigation projects focused on addressing previously identified issues in these specific hazard categories are given priority, with a focus on projects providing the highest cost to benefit ratio. In addition, Development, Building, Fire and Flood Ordinances are updated appropriately, and fully applied to all new development to minimize the impacts of all potential identified hazards.

The participating jurisdictions prioritized the actions based on the severity of the hazards and the cost of each action.

Funding for the mitigation actions will be through FEMA mitigation grants. The participating jurisdictions will pursue additional funding sources that are available in future.

5.5 Multi-Jurisdictional Mitigation Strategy

The CSD, Fire Authority, City of Big Bear Lake, and Big Bear Municipal Water District comprise the four jurisdictions with local governing authority in the Big Bear Valley. The hazard analysis effectively addresses hazard exposure to all areas within these three jurisdictional boundaries. Accordingly, the CSD, Fire Authority, City, and BBMWD work together through the Big Bear Valley Mountain Mutual Aid Association and other joint Board memberships to development a hazard mitigation strategy that maximizes hazard reduction exposure throughout the Big Bear Valley. This includes the identification, evaluation and implementation of hazed mitigation projects across jurisdictional boundaries. This also includes providing local mutual aid through sharing of personnel and resources to minimize the impacts of a hazard event across our jurisdictional boundaries.

Section 6 – Plan Maintenance

6.1 Monitoring, Evaluating and Updating the Plan

6.1.1 Changes in priorities within the past five years.

City of Big Bear Lake - There have been no changes in priorities since the 2012 LHMP was approved.

Big Bear City Community Services District - There have been no changes in priorities since the 2013 LHMP was approved.

Big Bear Fire Authority - The Fire Authority does not have a previous plan so there are no changes in priorities to report.

Big Bear Municipal Water District - The District does not have a previous plan so there are no changes in priorities to report.

6.1.2 Description of Plan Maintenance Procedures:

Representatives from the Big Bear Fire Authority, City of Big Bear Lake, Big Bear City Community Services District, and Big Bear Municipal Water District will continue to oversee plan maintenance and will serve as the plan's facilitator, responsible for holding regularly-scheduled meetings, assigning specific tasks as necessary to monitor and update the plan with planning members. Committees may be established as deemed necessary to ensure the upkeep of the plan. The established Planning Team will reconvene at least once per year to evaluate the effectiveness of previously implemented mitigation actions, examine the progress of non-capital actions, review mitigation efforts and actions being undertaken through other existing plans (i.e., comprehensive general plans), address changing land use patterns and new developments, and identify any changes in risk assessment and/or risk vulnerability. At the end of the next five-year cycle of the Action Program, the Planning Team will

oversee a major update to the plan that follows the Federal planning criteria in effect at the time of the update. The updated plan will again be submitted through the State Office of Emergency Services for Federal Emergency Management Agency approval.

6.2 Implementation through Existing Programs

6.2.1 Previous Incorporation of the LHMP into other planning mechanisms

This does not apply to Big Bear Fire Authority or Big Bear Municipal Water District because it is a new plan and not an update.

Big Bear Lake: Section 6.2 of the 2012 LHMP included the following planning mechanisms to incorporate the LHMP into.

- Big Bear Lake Emergency Operations Plan
- Local capital improvement plans
- Other plans
- San Bernardino County Operational Area Coordinating Council
- Mountain Mutual Aid Organization
- Bear Valley Fire Safe Council
- Big Bear Lake Fire Protection District
- Mountain Area Safety Taskforce

The City was not able to incorporate the 2012 LHMP into any of these planning mechanisms during the plan maintenance period due to insufficient staffing.

Big Bear City CSD: Sections 7.2 and 5.2 of the 2013 LHMP included the following planning mechanisms to incorporate the LHMP into.

- The District's Emergency Operations Plan (Section 7.2 – cross references Section 5.2)
- Other plans listed in Section 5.2:
    - Water System Emergency Response Plan
    - Water System Master Plan
    - Sewer System Management Plan
    - Fire Protection Master Plan
    - Overflow Emergency Response Plan
    - Storm Water Pollution Prevention Plan
    - Emergency Operations Plan
    - Capital Improvement Plan
    - Sewer Master Plan

The District was not able to incorporate the 2013 LHMP into any of these planning mechanisms during the plan maintenance period due to insufficient staffing.

6.2.2 Incorporation of the 2020 LHMP in to other planning mechanisms - This updated document will be incorporated as part of the City of Big Bear Lake and Big Bear City Community Services District Emergency Operations Plans. Additionally, reference to this updated document will be included in the "Environmental Hazards Element" of the City of Big Bear Lake General Plan. Capital budgeting requirements will be included into local capital improvement plans as deemed appropriate. All incorporations of this plan and the activities herein to other plans shall be given the adequate public process and approval of the legislative bodies. Big Bear Fire Authority is the responding agency for the City of Big Bear Lake, Big Bear Lake Community Services District, and Big Bear Municipal Water District. They intend to integrate wildfire mitigation actions into their wildfire reduction program.

Implementation of mitigation efforts will be channeled through applicable agencies such as The San Bernardino County Operational Area Coordinating Council, Mountain Mutual Aid Organization, Bear Valley Fire Safe Council, Mountain Area Safety Taskforce, etc.…

6.3 Continued Public Involvement

A critical part of maintaining an effective and relevant natural hazards mitigation plan is ongoing public review and comment. Consequently, the Big Bear Fire Authority, City of Big Bear Lake, Big Bear City Community Services District and Big Bear Municipal Water District continue in their dedication to providing for the direct involvement of its citizens in providing feedback and comments on the plan on a continued basis. To this end, the Big Bear Fire Authority, City of Big Bear Lake, Community Services District, and Big Bear Municipal Water District have placed this document on their jurisdictional websites and provided the public with contact information as to where their input and comments regarding the plan can be submitted for consideration by each jurisdiction. Public meetings will be held when significant modifications to the plan are required or when otherwise deemed necessary. The public will be able to express their concerns, ideas and opinions at the meetings.

APPENDIX A

[ON FOLLOWING PAGE]

APPENDIX A

17.10.070 - Property maintenance.

A. Fire Protection. In compliance with the City of Big Bear Lake Municipal Code Title 8(Health and Safety) Chapter 8.72 (Refuse and Weed Abatement) it shall be the duty of every owner, occupant and person in control of any land or interest therein in the city to abate there from and from all sidewalks, parkways and from any public highway or any public easement adjacent to such land, all noxious weeds or vegetation, dry grass, Russian thistle (tumbleweeds) dead trees, and all combustible rubbish or vegetation that constitutes a fire hazard, which may endanger or injure neighboring property or the health, safety or well-being of persons or property.

B. Tree Conservation Requirements. The following requirements shall apply to all properties within the city:

1. Landscaping material, which requires daily surface watering, shall not be planted within the drip line of native conifer and oak trees. Instead, plants within this area shall be drought resistant and require no more water than the native trees. If any irrigation is needed, drip irrigation shall be used.
2. Irrigation lines and sprinkler heads shall not be placed so as to spray on tree trunks of native conifer and oak trees. For native conifer and oak trees, irregular deep watering is encouraged, rather than daily surface watering. Every effort should be made to install irrigation trenches outside the critical root zones. Soil should only be compacted where the job engineer requires. Trenches should be backfilled as soon as possible.
3. No changes to the grade shall occur within the critical root zone of existing trees through construction of retaining walls, cut or fill, or other means, without plan review and approval pursuant to Sections 17.10.040 and 17.10.050 of this chapter.
4. No pavement shall be installed within the critical root zone of existing native trees without issuance of a plan review and approval pursuant to Sections 17.10.040 and17.10.050(B)(2) of this chapter.

C. Defensible Space. It shall be the responsibility of every property owner occupant and person in control of any land interest to abate the accumulation of forest fuels around their property, through implementation of the following measures within ten (10) feet of roads and driveways, and within an area surrounding the dwelling unit(s) from zero to one hundred (100) feet in the front and rear yards, or to the property lines (whichever is less); and between the dwelling unit(s) and side property lines:

1. Remove all dead trees, and all combustible rubbish, burnable fuels, debris, or noxious material that constitutes a fire, health or safety hazard, or which may endanger or injure neighboring property, or the health, safety, or well-being of persons or property including but not limited to all pine needles and branches on roofs, ground debris, logs and snags, grass four inches and higher, pine needles on the ground down to a two-inch depth, and dead branches in bushes and trees.

Exception: Grass, flammable vegetation and other combustible growth located more than thirty (30) feet from any structure and less than eighteen (18) inches in height may be maintained where necessary to stabilize the soil and prevent erosion.

2. Cut logs or firewood greater than one cord of wood or one hundred twenty-eight (128) cubic feet shall be located ten (10) feet away from any structure or shall be covered with a fire resistive structure or fabric. Firewood should be stacked away from the drip line of trees.
3. Thin dense groups of young trees (less than six inches in diameter) to a six to eight foot spacing, measured trunk to trunk. Removal of any live tree with a diameter of more than twelve (12) inches measured at four and one-half feet above the ground requires approval by the city.
4. In areas with a continuous canopy, any tree taller than forty-five (45) feet should have its branches trimmed back to the trunk if those branches have any portion lower than twelve (12) to fifteen (15) feet from the ground. A tree shorter than forty-five (45) feet should be trimmed to remove any dead branches up one-third of its total height. For non-continuous canopy areas, tree branches shall be pruned to remove limbs located less than six feet above the ground service. A minimum vertical separation between the top of a shrub and the bottom lower branches shall be three times the height of the shrub.

APPENDIX B

[ON FOLLOWING PAGE]

17.10.075 - Native brush and shrub.

APPENDIX B

modified

A. Municipal Code Section 8.94.010 Native Brush and Shrubs.
   1. It shall be the duty of every owner of real property in the City of Big Bear Lake to abate as a nuisance from such real property and from all parkways, native brush and shrubs, that constitute a fire, health, or safety hazard, or which may endanger or injure neighboring property, or the health, safety, or well-being of persons or property.
   2. Juniper shrubs, Spanish broom, and native brush shall not be planted or maintained within fifteen (15) feet of any building or structure, including, without limitation, any deck or patio. All owners of any real property in the City of Big Bear Lake shall be required to fully comply with this provision by modifying the offending native brush and shrub, which shall be considered a nuisance, from within fifteen (15) feet of any building or structure.
   3. All native brush and shrubs shall be installed and maintained in a manner that minimizes fire risk, including, without limitation, by removing dead branches and twigs at all heights, modifying the lower foliage of branches, and selectively pruning to reduce the density of the plant.
   4. Native brush and shrub shall be installed and maintained with horizontal spacing such that the space between two shrubs (horizontally) shall be a minimum of two times the height of the tallest shrub. Individual shrubs or groups of shrubs clumped together shall be modified so that their diameter does not exceed fifteen (15) feet. Groups of shrubs clumped together with a diameter of fifteen (15) feet or less shall be treated as a single plant.
   5. Paragraphs (B), (C) and (D) of this section shall not apply to an isolated shrub or shrubs that have been heavily modified by thinning and limbing up, nor to activities within the boundaries of a plant conservation easement area, that do not, in the opinion of the fire chief, or his or her designee, constitute a fire hazard. In deciding whether such shrub or shrubs constitute a fire hazard, the fire chief, or his or her designee, shall consider (i) the proximity of the shrub(s) to other buildings or structures; (ii) the types of shrub(s) involved; (iii) the potential threat of the shrub(s) to the public health, welfare and safety; and (iv) any other factors that the fire chief, or his or her designee, deem relevant when considering the public health, safety and welfare, including, without limitation, whether such shrub(s) is endangered, rare or threatened.
   6. Cut and/or thinned vegetation shall be disposed of no later than ten (10) days after cutting.

B. Municipal Code Section 8.94.020 Environmental Exemptions. The modification of brush or shrubs, as described in this chapter, shall be exempt from the provisions of this chapter if any or all of the following would occur:
   1. The activities would result in the taking of endangered, rare, or threatened plant or animal species. By way of example, and not by way of limitation, the following species of plant are, as of the date of the ordinance adopting this chapter, not threatened or endangered and are subject to the provisions of this chapter:
      a. The arctostaphylos patula species of manzanita.
      b. The cercocarpus ledifolius species of mountain mahogany (brush form) (commonly known in Big Bear Valley as ironwood).
      c. Sage species that occur in the Big Bear Valley.
   2. The activities would result in significant erosion and sedimentation of surface waters. The owner of each piece of real property within the City of Big Bear Lake shall, when performing modifications required by this chapter, keep soil disturbance to a minimum, especially on steep slopes. Erosion control techniques such as leaving root balls intact, minimizing use of motorized equipment and covering exposed disturbed soil areas with mulch or similar materials shall be employed in order to help reduce soil erosion and plant re-growth.

C. Municipal Code Section 8.94.030 Exceptions to Ordinance.
   1. Nurseries, and other similar agricultural and/or horticultural uses shall be exempt from Chapter 8.94, provided the fire chief, or his or her designee, shall have the discretion to enforce the provisions of this chapter with respect to such businesses as he or she deems necessary to promote the public health, safety and welfare as it relates to fire safety and/or the health of the forest. In using his or her discretion, the fire chief, or his or her designee, shall consider: (i) the health of the brush and/or shrubs involved; (ii) whether the brush and/or shrubs pose a risk to the public health, safety or welfare of the community; (iii) the type of brush and/or shrubs involved: (iv) the owner's maintenance activities involving the brush and/or shrubs; and (v) any other factors that the fire chief, or his or her designee, deem relevant when considering the public health, safety and welfare, including, without limitation, whether such shrub(s) is endangered, rare or threatened.
   2. Up to two inches of dead pine needles, leaves and other soils amendments for soil replenishment and forest safety may be permitted when in the opinion of the fire chief or his/her designee they do not constitute a fire hazard. In deciding whether they present a fire hazard, the fire chief or his/her designee shall consider:
      a. The proximity of the pine needles and leaves to buildings or structures;
      b. The height of the lower branches of shrubbery from the ground (as per Section 8.94.010(C), above);
      c. The condition of the shrubbery, (e.g., free from dead and dying limbs and leaves) (as per Section 8.94.010(C), above);
      d. The sectioning of the shrubbery (as per Section 8.94.010(D), above); and
      e. Any other factors that the fire chief or his/her designee deem relevant when considering the public health, safety and welfare.

D. Municipal Code Section 8.94.040 Certificate of Compliance Required. Upon the effective date of the ordinance adopting this chapter, the owner of the each piece of real property within the City of Big Bear Lake: (i) As a condition precedent to, the issuance of any discretionary permit or any building permit; or (ii) As a condition precedent to, the issuance of an initial

APPENDIX C

[ON FOLLOWING PAGE]

Chapter 15.64 - FLOODPLAIN MANAGEMENT

APPENDIX C

ARTICLE I. - GENERAL PROVISIONS

15.64.010 - Statutory authorization.

The legislature of the state of California has in Government Code Sections 65302, 65560, and 65800 conferred upon local government units authority to adopt regulations designed to promote the public health, safety, and the general welfare of its citizens. Therefore, the city council of Big Bear Lake does hereby adopt the following floodplain management regulations.

(Ord. 2002-324 § 1(part), 2002)

15.64.020 - Findings of fact.

The city council hereby finds that there is a need to manage floodplains within the city to promote public health, safety and the general welfare of its citizens and finds the following:

A. The flood hazard areas of the city of Big Bear Lake are subject to periodic inundation which results in loss of life and property, health and safety hazards, disruption of commerce and governmental services, extraordinary public expenditures for flood protection and relief, and impairment of the tax base, all of which adversely affect the public health, safety, and general welfare.

B. These flood losses are caused by uses that are inadequately elevated, flood proofed, or protected from flood damage. The cumulative effect of obstructions in areas of special flood hazards, which increase flood heights and velocities, also contribute to the flood loss.

(Ord. 2002-324 § 1(part), 2002)

15.64.030 - Statement of purpose.

It is the purpose of this chapter to promote the public health, safety, and general welfare, and to minimize public and private losses due to flood conditions in specific areas by provisions designed to:

A. Protect human life and health;

B. Minimize expenditure of public money for costly flood control projects;

C. Minimize the need for rescue and relief efforts associated with flooding and generally undertaken at the expense of the general public;

D. Minimize prolonged business interruptions.

E. Minimize damage to public facilities and utilities such as water and gas mains; electric, telephone and sewer lines; and streets and bridges located in areas of special flood hazard;

F. Help maintain a stable tax base by providing for the sound use and development of areas of special flood hazard so as to minimize future blighted areas caused by flood damage;

G. Ensure that those who occupy the areas of special flood hazard assume responsibility for their actions.

(Ord. 2002-324 § 1(part), 2002)

15.64.040 - Methods of preventing flood loss.

In order to accomplish its purposes, this chapter includes methods and provisions to:

A. Restrict or prohibit uses which are dangerous to health, safety, and property due to water or erosion hazards, or which result in damaging increases in erosion or flood heights or velocities;

B. Require that uses vulnerable to floods, including facilities that serve such uses, be protected against flood damage at the time of initial construction;

C. Control the alteration of natural floodplains, stream channels, and natural protective barriers, which help accommodate or channel floodwaters;

D. Control filling, grading, dredging, and other development which may increase flood damage; and

E. Prevent or regulate the construction of flood barriers which will unnaturally divert floodwaters or which may increase flood hazards in other areas.

(Ord. 2002-324 § 1(part), 2002)

15.64.050 - Definitions.

Unless specifically defined below, words or phrases used in this chapter shall be interpreted so as to give them the meaning they have in common usage and to give this chapter its most reasonable application:

"Accessory use" means a use that is incidental and subordinate to the principal use of the parcel of land on which it is located.

APPENDIX D

[ON FOLLOWING PAGE]

Chapter 17.11 - WATER CONSERVATION

Sections:

APPENDIX D

17.11.010 - Purpose.

The purpose of this chapter is to provide water conservation measures in order to minimize the effect(s) of a water shortage on the citizens of, visitors to, and the economic well-being of the city and, by means of this chapter, to adopt provisions that will significantly reduce the wasteful and inefficient consumption of water over an extended period of time, thereby extending the available water resources required for the domestic, sanitation and fire protection needs of the citizens of, and visitors to, the city, while reducing the hardship of the city and the general public to the greatest extent possible.

(Ord. 87-151 § 1, 1987)

17.11.020 - Policy, objectives and goals.

It is declared that, because of the conditions prevailing in the city of Big Bear Lake and areas elsewhere from which the city of Big Bear Lake obtains its water supplies, the general welfare requires that the water resources available to the city be put to the maximum beneficial use to the extent to which they are capable and that the wasteful, inefficient or unreasonable use or method of use of our limited and finite water resources be prevented. As such, the conservation of such waters is to be exercised with a view to the reasonable and beneficial and efficient use thereof, in the interests of the people of the city and for the public welfare. Therefore, the city of Big Bear Lake declares and establishes the following goals, objectives and policies pertaining to the conservation and use of water:

A. Goals.
   1. The conservation of water;
   2. The efficient use and distribution of available water supplies;
   3. Adequate and sufficient potable water supply and availability for the greatest public benefit, with particular regard to human consumption, sanitation and fire protection.

B. Objectives.
   1. To conserve available water supplies;
   2. To achieve an overall water use reduction;
   3. To reduce the volume of wasted water;
   4. To reduce the demand for water and thus to slow down the need for new capital facilities;
   5. To continuously increase consumer awareness about the need for, and benefits of, water conservation;
   6. To reduce or eliminate wasteful and inefficient uses of water;
   7. To assure an adequate supply of potable water sufficient to meet the essential private and public needs of the city's growing population and economy;
   8. To minimize leakage of water from the distribution system;
   9. To assure that all new developments and that existing developments which are resold, remodeled or added to are equipped with water-conserving devices, fixtures and appliances;
   10. To increase the use of native or water-conserving plant species for landscaping purposes;
   11. To assure that development occurring on identified groundwater recharge areas maintains or enhances the site's natural water recharge characteristics and attributes.

C. Policies.
   1. All new structures shall be (re)equipped with low-flush toilets, as per Section 17921.3 of the California Health and Safety Code, and with low-flow showers and faucets, as per Title 24, Part 6, Article 1, T20-1406F of the California Administrative Code, in addition to

APPENDIX E

[ON FOLLOWING PAGE]

ENVIRONMENTAL HAZARDS ELEMENT

CHAPTER 1: Geotechnical Hazards

CHAPTER 2: Flooding and Hydrology

CHAPTER 3: Hazardous and Toxic Materials

CHAPTER 1: GEOTECHNICAL HAZARDS

PURPOSE

The purpose of the Geotechnical Hazards Chapter of the Environmental Hazards Element is to provide information, as well as goals, policies, and programs to protect the general health, safety and welfare of the City's population from seismic and other geotechnical hazards, and to educate the community and its residents about seismic and related geologic hazards. The Chapter is also meant to satisfy the requirements of state law, including the Alquist-Priolo Earthquake Fault Zoning Act (amended). The Chapter and its supporting documentation are also intended to provide a regularly updated information database on geotechnical hazards affecting the region, which will serve as the basis for ongoing land use policies and decisions. Other General Plan elements that are directly or indirectly related to the Geotechnical Chapter include Land Use, Circulation, Housing, and Public Services and Facilities. The Emergency Preparedness Chapter of the Public Services Element of the General Plan is most directly related to these seismic safety issues embodied in this Chapter.

BACKGROUND

The City of Big Bear Lake and the General Plan study area are located in the Transverse Ranges physiographic province of southern California. This province is characterized by an east-west grain caused by compression at the "Big Bend" of the Southern San Andreas fault. The name originates from the result of structures within the block being transverse (east-west) to the main plate-boundary formation related to the San Andreas fault. The Transverse Range structural block is composed of sub-blocks consisting of the Santa Ynez, the San Gabriel, the Banning, the San Bernardino, and the Pinto Mountains sub-blocks. The major faults of the sesub-blocks are left- lateral and/or reverse faults.

The San Bernardino Mountains have been uplifted quite recently in geologic time and appear to continue to shift today. As the range uplifted, very rugged and steep topography developed along the perimeter of the old granitic terrain that once may have been part of the southeastern Mojave Desert. During uplift, deep narrow canyons began to work headward and downward into the elevated peneplained (plains shaped by erosion) uplands. The City of Big Bear Lake is located in the center of the San Bernardino Mountains, which are bounded on their west side by the San Andreas fault. In the late Quaternary, forces associated with plate motions at the boundary of the North American and Pacific plates, and subsequent crustal adjustments, have elevated the mountains to their present elevations of between 6,000 and 11,500 feet above mean sea level.

Movement along these two tectonic plates is responsible for the earthquakes that occur in Southern California, with about 70 percent of this movement being accommodated by the San Andreas Fault Zone.

Applicable Legislation

Requirements for the development of an element addressing seismic safety issues are found in both the California Government Code and Public Resources Code. Government Code Section 65302(g) requires that the General Plan address the need to protect the community from unreasonable risks associated with the effects of seismically induced surface rupture, ground shaking, ground failure, dam failure, subsidence and other known geologic hazards. In accordance with Government Code Section 65303, the City General Plan may also address other subjects related to the physical development of the community, as provided in other Elements of this Plan.

The most important piece of legislation related to this Element is the Alquist-Priolo Earthquake Fault Zoning Act, which is found in Public Resources Code Sections 2621 et. seq. The location of these study zones must be disclosed to the general public through the use of maps and other appropriate materials (Title 14, California Administrative Code Section 3603 (b)).

Finally, Government Code section 8876 establishes a program by which the City and all other jurisdictions located within the most severe seismic zone shaking (Zone 4), as set forth in Chapter 2-23 of Part 2 of Title 24 of the Administrative Code, shall identify all potentially hazardous or substandard buildings and shall establish a program for the mitigation of these buildings' inadequacies.

Alquist-Priolo Earthquake Fault Zoning Act

Previously known as the Alquist-Priolo Special Studies Zone Act adopted in 1972, the Act's primary purpose is to mitigate the hazards associated with fault rupture by prohibiting the location of structures for human occupancy across the trace of an active fault. Earthquake fault zones, which are sufficiently active and well defined, have been designated on maps prepared by the State Division of Mines and Geology. Study area boundaries range from 200 to 500 feet on either side of an active fault, depending on whether it is a minor or major fault. The Act defines active faults as those that have evidenced movement during the past 11,000 years (Holocene epoch).

There are currently no Alquist-Priolo (A-P) Zones for the City of Big Bear Lake. In accordance with the A-P Act, new faults are added as "Special Study Zones" that can be "well defined" and are determined to have ruptured within the past 11,000 years ("sufficiently active"). Recent photo lineation studies in the region have helped identify potential fault structures. However, the mountainous region has few geologically young sediments to determine activity. It is, therefore, considered unlikely that mapped lineations would be incorporated into Special Studies Zones in the near future.

GEOTECHNICAL CONDITIONS IN THE BIG BEAR LAKE REGION

Located along one of the most active tectonic boundaries on the globe, the Big Bear area and Southern California region are susceptible to a wide range of hazards associated with geotechnical conditions. Recent studies indicate that far too few earthquakes have occurred in Southern California in the last 200 years to account for the rate of movement between the Pacific and North American

plates. The data suggest that the region will be subject to either numerous, moderate earthquakes (such as the Northridge quake) or a few large (magnitude 7.2 or larger) earthquakes. Therefore, the City and the region must factor in these geologic threats in the development of appropriate policies and programs.

Geologic Units, Basement Rocks, Alluvium and Sand

In addition to the tectonic forces acting on the Big Bear Lake area, geologic hazards and geotechnical constraints are also affected by the characteristics of the rocks and sediments that underlie the area.

The basement complex of the San Bernardino Mountain Range consists of Precambrian gneiss (approximately 1 million-year-old foliated metamorphic rock composed of granite or some other crystalline rock) unevenly overlapped by shelf quartzite and carbonates. It includes a large batholith (a great mass of intruded igneous rock) exposed throughout the San Bernardino Mountains. This basement complex is considered to be geologically part of the Mojave crustal block and is presumed to have been part of the Mojave Desert during Tertiary and probably early Quaternary time (70,000 years ago to present time).

The City of Big Bear Lake is situated in Big Bear Valley, a bedrock-enclosed basin infilled with Quaternary sediments consisting of alluvial (stream-deposited), colluvial (sediment deposited at the base of steep slopes), and lacustrine (lake) sediments or deposits. Bedrock on the western side of the Valley is predominantly granitic rocks (quartz diorite, granodiorite and quartz monzonite) with minor monzonite and diorite at Delamar Mountain. A more detailed discussion of the engineering characteristics of these various geologic units can be found in the General Plan EIR and the geotechnical report found in the EIR appendices.

Measurements of the Seismic Hazards in Big Bear Lake

As discussed below, earthquakes are classified by their magnitude and by their intensity. The intensity of seismic ground shaking is a function of several factors, including the magnitude of the quake, distance from the epicenter, and the local geologic and topographic conditions. Analysis of the San Andreas Fault indicates the potential for a major seismic event. The City generally lies within intensity zones VII through IX, as defined in the Modified Mercalli Intensity Scale (see below). This intensity range can result in considerable damage in specially designed structures, well-designed structures thrown out of plumb, and great damage can occur in substantial buildings with partial collapse. Buildings can also be shifted off their foundations, underground pipes broken, and the ground cracked markedly.

The largest or maximum credible earthquake a fault is capable of generating is used for community planning purposes. Maximum seismic design parameter values, including peak ground or bedrock acceleration, duration of strong ground shaking, and period of ground motion (frequency), are derived from maximum credible earthquakes to establish safety margins. These potential effects associated with local faults are discussed below.

Richter Scale

Faulting and ground rupture, or the breakage of bedrock and overlying sediments, along tectonic plate boundaries, and associated ground acceleration or motion, are the most significant potential geotechnical hazards affecting the General Plan study area. Earthquakes are typically defined by their magnitude as measured on the Richter Scale. Each whole number step in magnitude on the scale represents a tenfold increase in the amplitude of the waves on a seismogram and about a 31-fold increase in energy released. As an example, a 7.5 magnitude earthquake is 31 times more powerful than a 6.5 magnitude quake.

Seismic Intensity and the Modified Mercalli Intensity Scale

The Modified Mercalli Intensity Scale (MMI or MMIS) is a more useful measure of the damage potential of earthquakes, and is based upon people's reactions to a quake, and observed damage to structures and other physical effects. There are twelve levels of intensity in this scale, ranging from I (tremor not felt) to XII (damage is nearly total). The effects of a quake on masonry and other buildings are an important part of characterizing the intensity using this scale.

MAJOR ACTIVE FAULTS AND THEIR POTENTIAL EFFECTS IN THE BIG BEAR LAKE AREA

Earthquakes can cause substantial property damage, the loss of public services and facilities and loss of life. Strong shaking from an earthquake can result in landslides, ground lurching, structural damage or destruction, and liquefaction. Strong shaking can also set in motion other hazards, including fires, disruption of essential facilities and systems (water, sewer, gas, electric, transportation, communications, irrigation and drainage systems), releases of hazardous materials, and flood inundation as a result of dam or water tank failure.

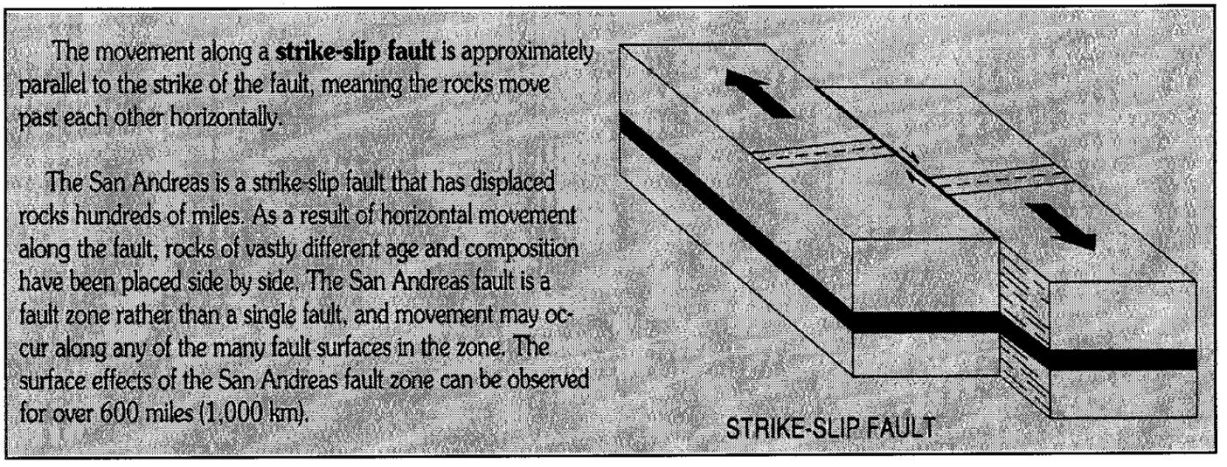
Ground shaking during an earthquake is the most significant seismic hazard that will impact the Big Bear Lake planning area. Critical parameters include distance between the fault and various points in the City, the maximum credible earthquake each fault is capable of generating, the intensity of ground shaking expressed as a fraction of the acceleration of gravity (g), and the MMI seismic intensity values that have been calculated for the City. In general, peak ground accelerations and seismic intensity values decrease with increasing distance from the causative fault. However, local site conditions, such as the top of ridges, may amplify the seismic waves generated by an earthquake, resulting in higher accelerations than those discussed below.

An effective seismic hazard reduction program, therefore, should include the identification and mapping of geologic and seismic hazards, the enforcement of building and fire codes, and the expedient retrofitting and rehabilitation of weak structures. Programs should also be developed to help City residents to provide for themselves and their families in the aftermath of an earthquake.

San Andreas Fault Zone

The San Andreas Fault Zone is the principal boundary between the Pacific and North American plates and locally has been divided into several segments. The San Bernardino Mountains segment is a structurally complex zone because in this area the San Andreas fault makes a left-step, and bends to trend in a more westerly direction. Compression associated with this left step is expressed as a zone of reverse, lateral and oblique-slip deformation that is accommodated by several sub-parallel fault strands. The most important of these are the Mission Creek, San Gorgonio Pass, and Banning faults. It is unclear how slip along the San Andreas fault is transferred through the San Gorgonio Pass, but research suggests that when the San Andreas ruptures in this area, slip can occur simultaneously along the San Gorgonio and Banning faults.

Several estimates of slip rate obtained independently indicate that the San Bernardino Mountains segment has a slip rate of 24 ± 5 mm/year, with an average recurrence interval of 146 years.
Paleoseismic studies at Wrightwood indicate that there have been six surface-rupturing earthquakes on this segment since 1192, with the most recent five events occurring, on average, every 106 years. The most recent surface- rupturing earthquake on this segment is thought to have occurred in 1812, 183 years ago. It is estimated that this segment has a 28 percent probability of rupturing in the time period between 1994 and 2024: The San Bernardino Mountains segment is the most geometrically complex part of the southern San Andreas fault, which also suggests that coseismic deformation will also be complex. An earthquake on the San Bernardino segment of the San Andreas fault is expected to result in a peak ground acceleration (PGA) of 0.273g and a MMI of IX for the City of Big Bear Lake.



The southernmost portion of the San Andreas Fault Zone capable of impacting the City is the Coachella Valley segment. No earthquakes have been recorded on this segment in historic times, and ongoing analysis suggests that the last surface rupture on this segment occurred around 1680. Studies at Indio indicate that prior to 1680, earthquakes on this fault occurred on an average interval of 220 years. There is evidence of simultaneous rupture along the San Bernardino and Coachella segments around 1680 and 1450. The Coachella segment has experienced creep (slow slippage) at the rate of

about 2-4 mm/year, but has a long-term slip rate of about 25 ±5 mm/year. This segment is estimated to have a 22 percent probability of rupturing in the period between 1994 and 2024. A Magnitude 8.0 earthquake on this segment is estimated to be capable of generating peak ground accelerations of 0.199 g and MMI of VII at Big Bear Lake.

Helendale Fault

The Helendale fault is one of the northwest-trending right-lateral strike-slip faults which collectively appear to be accommodating between 9 percent and 23 percent of the motion between the North American and Pacific Plates. These faults are referred to as the Eastern California or Mojave shear zone. An earthquake of magnitude 7.3 on this fault located about 6 miles from Big Bear Lake is estimated capable of generating a peak horizontal ground acceleration of 0.328 g and MMI of IX. Trenching of the Helendale fault indicates that the fault has ruptured on three occasions during the last 16,000 years, indicating a recurrence interval of 5, 000-7,000 years. The Helendale fault appears to cut through and offset the North Frontal fault zone.

North Frontal Fault Zone

The North Frontal fault is a partially blind south-dipping thrust with a slip rate of 0.5 mm/year. Thrusting along this fault system accounts for about 1 mm/year uplift of the San Bernardino Mountains. This fault is located 7 miles from Big Bear Lake and is believed capable of generating an earthquake of magnitude 7. 7 with a peak horizontal ground acceleration of 0.352 g and MMI of IX. The North Frontal fault zone interacts with several other faults at a variety of intersections. It appears to be offset right-laterally by the Helendale fault, and forms a complex junction with the Old Woman Springs fault.

Lenwood-Old Woman Fault

An earthquake of magnitude 7.3 on these segments is estimated capable of generating a peak horizontal ground acceleration of 0.144g and MMI seismic intensity of VIII at Big Bear Lake. A slip rate of 0.8mm/year is reported for the Lenwood segment. Trenching of the fault indicates three Holocene earthquakes 200-400, 5,000-6,000, and 8,300 years ago. Prior to the Landers earthquake, creep was recorded but not verified for the Lenwood segment. The Lenwood segment experienced triggered slip near its southeast end due to the Landers earthquake. The Old Woman Springs segment is the main trace in a complex system of faulting, interacting with both the North Frontal zone and the Lenwood fault.

San Gorgonio-Banning Fault

The San Gorgonio-Banning fault system is located 19 miles south of the City of Big Bear Lake. An earthquake of magnitude 7.5 on these segments is estimated capable of generating a peak horizontal ground acceleration of 0.159g and MMI of VIII at Big Bear Lake. These faults represent a complex zone of faults formed where the San Andreas interacts with several other faults, including the San Jacinto and Pinto Mountain faults. Complex motions on these segments include right-lateral strike-slip, oblique right-reverse, and thrust. These fault segments interact with the San Andreas fault.

zone in the vicinity of San Gorgonio Pass, leading some researchers to propose that they may rupture concurrently with the San Andreas.

Johnson Valley Fault

The June, 1992 Magnitude 7.6 Landers Earthquake occurred on the Johnson Valley Fault and was strongly felt in the Big Bear Lake area. It is a northwest trending fault that, in conjunction with nearby parallel faults, is accommodating between 9 and 23 percent of the movement between the Pacific and North American plates. Trenching indicates that this fault last ruptured about 9,000 years ago. Although unlikely to occur in the near future, an earthquake of magnitude 7 .5 on this or nearby faults is estimated to be capable of generating peak horizontal ground accelerations of about 0.105 g and MMI of VII at Big Bear Lake.

Unnamed Faults

The June 28, 1992, M_w 6.4 Big Bear earthquake occurred on an unnamed fault. The peak horizontal ground acceleration (0.57 g) was greater than that expected on named faults (0.352 g), indicating that these undiscovered and/or unnamed faults may pose a greater threat to the Big Bear community than those which are clearly mapped. Throughout southern California, numerous unnamed and "blind" faults pose an additional emerging threat to the area's communities.

To date, about 200 known faults are mapped within the southern California region. Scientists in southern California account for undiscovered and blind faults by using Global Positioning Systems (GPS) to determine the rates at which sites are moving relative to one another.

The mountainous regions of southern California are there because earthquakes are pushing them up; therefore, the most recent Southern California Earthquake Center (SCEC) regional study indicates that the San Bernardino Mountains region should anticipate ground shaking that exceeds 0.20 g about 4 to 5 times each 100years.

OTHER SEISMICALLY INDUCED 'GEOLOGIC HAZARDS

In addition to direct effects such as ground rupture and ground acceleration, there are other seismically induced hazards that can injure people and damage structures. These hazards include liquefaction, dynamic settlement, ground fracturing or fissuring, lateral spreads, slumps, landslides, and earth or rock falls. Each of these is briefly discussed below.

Liquefaction

Liquefaction typically occurs in loose, saturated sediments of primarily sandy composition, in the presence of ground accelerations over 0.2 g. When liquefaction occurs, the sediments involved have a total or substantial loss of shear strength, and behave like a liquid or semi-viscous substance. Liquefaction can cause structural distress or failure due to settlement, a loss of bearing capacity in the foundation soils, and the buoyant rise of buried structures. The excess hydrostatic pressure

generated by ground shaking can result in the formation of sand boils and mud spouts, and/or seepage of water through ground cracks.

As indicated above, there are three general conditions that need to be met for liquefaction to occur. The first of these—strong ground shaking of relatively long duration—can be expected to occur in the General Plan area, as a result of an earthquake on any of several active faults in the region. The second condition--loose, or unconsolidated, recently deposited sediments consisting primarily of silty sand and sand—occurs in a large portion of the valley floor, in the northern and central portion of the General Plan area. In addition, these sediments satisfy the third condition of being saturated. Depending on the level of the Lake, ground water in this area typically occurs within 50 feet below the ground surface. Therefore, the potential for these sediments to liquefy is high to moderate. The southern portion of the City, on the other hand, is underlain with older alluvium or bedrock, with a low or non-existent liquefaction potential.

Regional mapping cannot account for local conditions, such as dense soil, abundant gravel and/or clay, or locally deep ground water. Therefore, site specific studies are recommended within the potentially liquefiable region prior to issuing construction permits. Local conditions demonstrate that liquefaction potential varies greatly in the City.

Currently for the City of Big Bear Lake, liquefaction mitigation is the responsibility of the project engineer. In California, the state-adopted Uniform Building Code (UBC) requires liquefaction investigation in all UBC Zone 4 regions that are underlain by shallow ground water within 30 feet of the surface. The low-lying regions of the City of Big Bear Lake meet these criteria, and are thus required to investigate liquefaction potential prior to site development and mitigate as necessary. Exhibit EH-4, Liquefaction Susceptibility Planning Map, is provided to guide planners and engineers when development plans are proposed; however, this exhibit should be construed as only a guide, since local soil and geologic conditions may vary. The Chief Building Official will review all new development proposals pursuant to the UBC to determine whether additional studies or structural requirements are needed.

Seismically Induced Settlement

Under some circumstances, strong ground shaking can cause densification or compaction of soils resulting in local or regional settlement of the ground surface. This can result in local differential settlement and damage to foundations and structures, as well as damage to water and sewer lines. Some of the steeper hillside terrain within the planning area may be subjected to such settlement. In addition, regional settlements can damage pipelines on water and sewer lines.

The potential for seismically induced settlement to occur is controlled by the intensity and duration of ground shaking, and the relative density (the ratio between the in-place density and the maximum density) of the subsurface soils. Recently deposited alluvial sediments are potentially subject to seismically induced settlement. Developments near the Lake shore, on artificial fill, or on stream-deposited sediments should include subsurface geotechnical investigations that address the potential for seismically induced settlement on a site-specific basis. This hazard can be mitigated

Exhibit EH-I-Liquefaction Susceptibility Planning Map

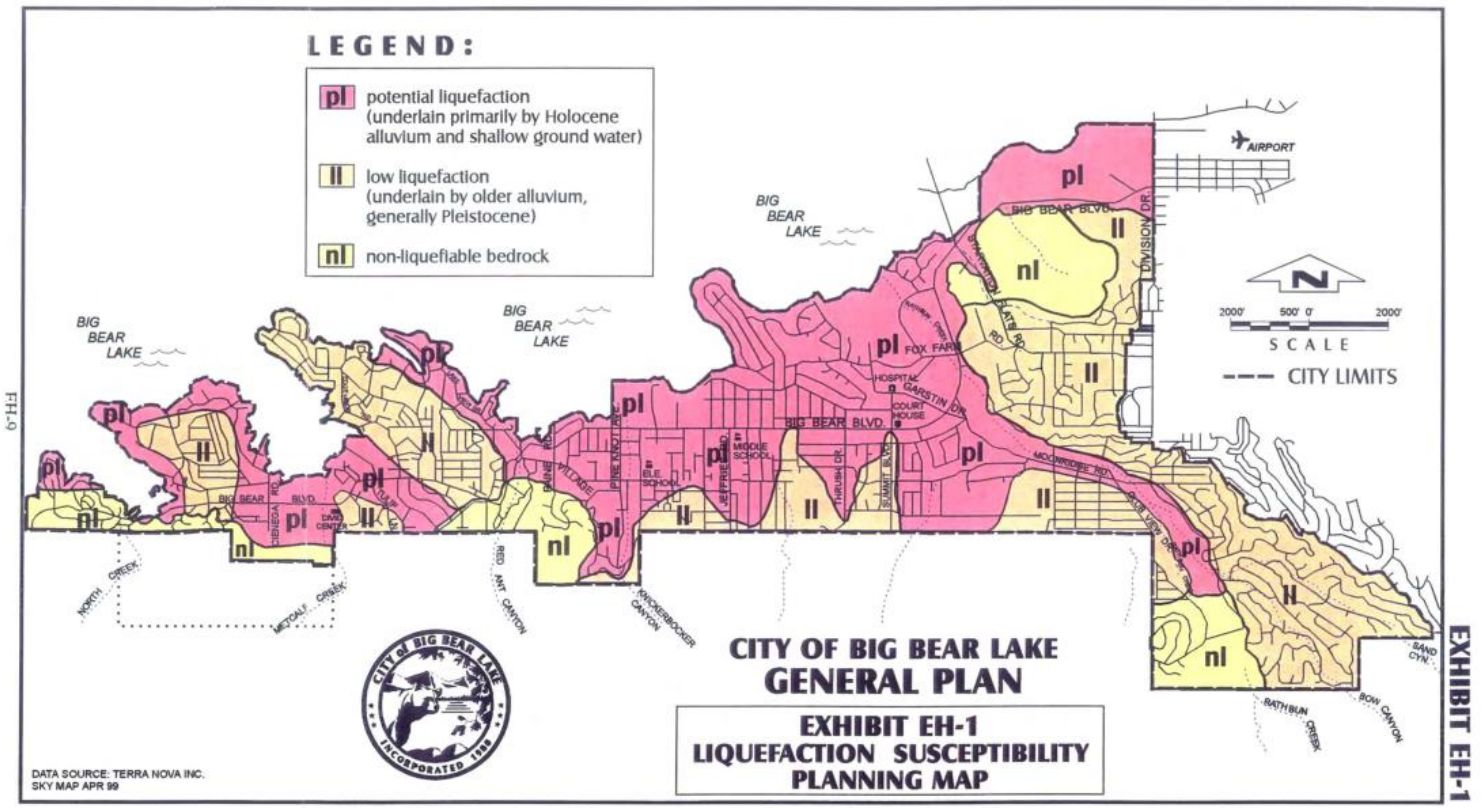
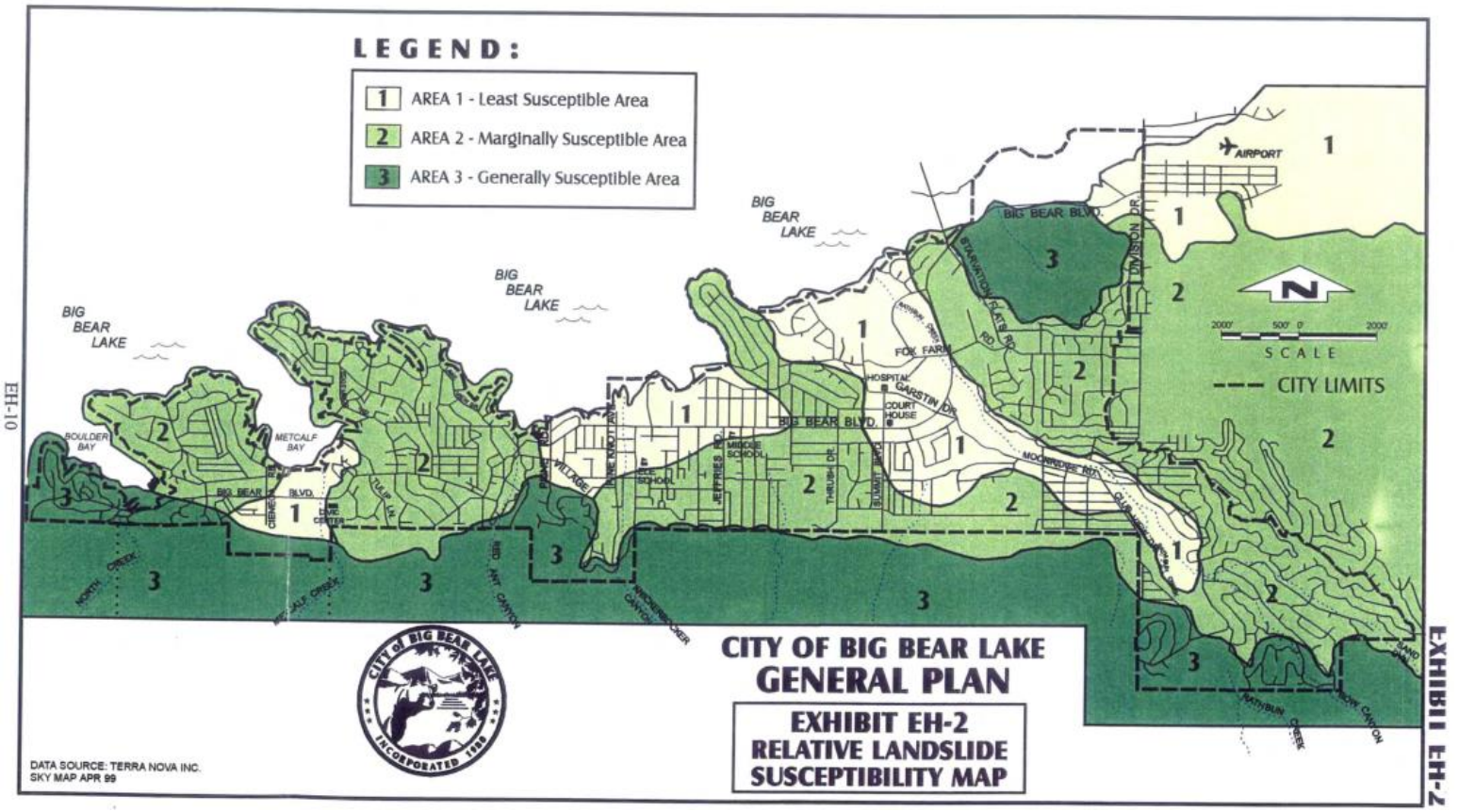


Exhibit EH-2-Relative Landslide Susceptibility Map



with proper site preparation that involves the densification of the subsurface soils, and with proper foundation design that can accommodate a limited degree of differential settlement resulting from seismic shaking.

Seismically Induced Slope Instability

Seismically induced landslides and rock falls may occur in areas with steep slopes. It is estimated that ground acceleration of at least 0.1 0g in steep terrain is necessary to induce earthquake-related rock falls. With several faults capable of generating peak ground accelerations over 0.10g in the study area, there is a high potential for seismically-induced rock falls and landslides to occur in some portions of Big Bear Lake and surrounding areas. Regional studies indicate that the San Bernardino Mountains area should anticipate ground shaking that exceeds 0.20 g about 4 to 5 times each 100 years.

Rock falls and general slope instability are relatively common and widespread in mountain areas due to seismic ground-shaking. The most notable rockfalls during the Big Bear earthquake were the falls associated with the very steep slopes of the Mill Creek and Whitewater River drainage areas about 10 to 15 miles south of Big Bear Lake. "Friction" fires were ignited by sparks from falling boulders in the Mill Creek region. Blocks associated with these falls weighed between 50 and 300 tons, and several landed within 30 to 100 feet of structures. Although no rock falls or landslides occurred within the planning area during that earthquake, slope instability was reported for over steepened slope cuts in the southeastern most portions of the City. Rather than granitic bedrock, this relatively steep region of the City is underlain by less well-consolidated alluvial terrace materials. Ridge top shattering was also reported throughout the epicentral region of the Landers and Big Bear earth quakes. Such ground shattering can be expected at the top of Rebel Ridge and Moonridge areas as a result of the topography locally focusing the earthquake shaking.

Exhibit EH-2 indicates the relative susceptibility to landslides of land within and adjacent to the planning area. Areas with the highest susceptibility are outside the City and Sphere of Influence boundaries. With the exception of a few areas in category 3 (generally susceptible), the planning area has a low or marginal susceptibility. However, the potential for landslides will be evaluated by the Chief Building Official as part of the review process for any new development proposals.

Seismically Induced Inundation

Failure of water tanks, reservoirs, retention basins, recharge basins and other water storage structures can be caused by seismic events, especially in areas susceptible to ground failure. There are several above-groundwater storage tanks in the City that could be subject to damage in an earthquake. Damage to these tanks could significantly hinder efforts to suppress fires and could greatly limit supply and availability of potable water after a major earthquake; however, the City's Department of Water and Power has recently completed a seismic retrofit program on all the water tanks in the City to mitigate this concern.

The City has no coordinated storm drainage system per se, although street drainage pipes are located throughout the City. Rathbun Creek is the only major flood control facility in the General Plan area, which is only partially maintained by the San Bernardino County Flood Control District. It is predominantly an earthen graded natural, unimproved drainage channel and is currently inadequate in some areas to contain 100-year storm flows. As drainage improvements are planned for the City, adequate flood control design must be balanced with efforts to maintain the integrity and health of the area's environmental resources. Additionally, design engineering of future major detention/retention facilities will need to focus on the seismic hazards of the area when planning for and constructing these facilities.

Collapsible and Expansive Soils

Soils are an important component of the geotechnical conditions in the General Plan study area. Two considerations are the potential of soils to collapse or to expand, causing damage to structures in either instance. Soil collapse typically occurs in recently (Holocene) deposited sediments laid down by wind or water. When saturated, collapsible soils undergo a rearrangement of their grains and a loss of cohesion or cementation, resulting in a substantial and rapid settlement even under relatively low loads. The alluvial sediments in the General Plan area are not considered especially prone to this type of collapse.

Expansive soils are those which include a significant amount of clay and are subject to swelling. Expansive soils can change in volume and can exert significant pressure on loads (such as buildings) that are placed on them. In the Big Bear Lake area, expansive soils are not considered a hazard because of the relatively minor amount of clay present in the alluvial soils derived from the regional granitic bedrock.

Inundation from Seiches

Big Bear Lake may be subjected to seiching as a result of an earthquake. A seiche is a free or standing-wave oscillation of the surface of water in an enclosed or semi-enclosed basin, such as a lake, bay or harbor. These waves can continue, pendulum fashion, for a time, even after the earthquake shaking ceases. Disturbance of the surface of Big Bear Lake as a result of the June 28, 1992, Big Bear earthquake was reported at a scale of several inches to several feet. However, the most significant seiching would be anticipated as a result of large near-regional or regional earthquakes that are more likely to subject the lake to longer-period ground shaking. Seiches usually occur in the direction of the longest diameter of the basin. The degree of inundation would vary depending on the duration and direction, of the earthquake shaking. Should the predominant direction of the earthquake match the natural tidal direction of the lake, inundation should occur.

Ground Subsidence

Ground subsidence is the gradual settling or sinking of the ground surface with little or no horizontal movement. In the areas of southern California where ground subsidence has been reported, this phenomenon is usually associated with the extraction of oil, gas or ground water from below the

ground surface. Ground subsidence can also occur as a response to natural forces such as earthquake movements, and the folding and subsiding activity of sedimentary basins. Earthquakes have caused abrupt elevation changes in excess of one foot across faults. Ground surface effects related to regional subsidence are generally restricted to structures sensitive to slight changes in elevations, such as canals, sewers, and drainage.

The Big Bear community relies entirely upon local ground water supplies. A series of vertical wells toward the center of the valley, as well as about eight slant wells within the nearby slopes, are utilized to service the Department of Water and Power's 14,000 customers (1997). Slant wells that remove ground water under gravity from slopes do not typically result in subsidence at the surface, nor has subsidence been reported associated with ground water withdrawal in the Valley. The maintenance of the level of the lake generally at 6,744 feet above sea level likely maintains ground water levels of similar height within the valley floor. Therefore, subsidence related to ground water withdrawal is considered unlikely while the Lake level maintains subsurface pore water pressure.

A small portion of the bed rock underlying the City consists of crystalline limestone that underlies the base of the Bear Mountain Ski Area. Subsidence hazards as a result of sinkhole formation are associated with limestone. However, studies show that the limestone in the region consists of Cambrian and uppermost Precambrian rocks that are considered crystalline and are much less likely to be dissolved by the actions of groundwater.

Bear Valley Dam

In 1884 construction was completed on the first Bear Valley Dam, built to provide the new community of Redlands with a dependable, year-round water source. By 1911, the present multiple arch dam was built just downstream from the 1884 dam, twenty feet higher than the first. The National Dam Inspection Program examined the dam in 1980 and required that a seismic analysis be performed. The conclusion of that analysis was to declare the structure unsafe during a magnitude 8+ seismic event on the San Andreas Fault or the Bear Creek Thrust Fault. Retrofit repairs for the dam begun by the Municipal Water District in May of 1988 were completed in the summer of 1989. Phase II repairs include Caltrans' reconstruction or relocation of the bridge which is currently located on top of the dam, to allow for construction of improved spill way capacity.

It should be of paramount interest of the City to ensure continuing professional management of Bear Valley Dam. The Bear Valley Dam consists of one of the most resistant designs to damage from earthquake shaking. The 1988- 89 retrofitted concrete arch dam and the strength of the underlying foundation materials make failure highly unlikely. High Lake levels can lead to increased flood hazard, slope instability and abnormally high rates of reservoir infilling of sediment (see Flooding and Hydrology Element).

Use of Exhibits

It should be noted that the maps included in this chapter show generalized locations of potential geologic hazards only, and should not be considered as a definitive indication that hazards exist or do not exist at any particular location. City staff and project applicants will continue to be responsible for performing geotechnical analysis as required by engineering standards and the California Environmental Quality Act, where appropriate. In addition, the maps are not intended to be used by the City to support requirements for additional analysis or mitigation, except where these requirements are deemed to be appropriate based upon conditions on the project site, available data and review by appropriate agencies at the time the project is proposed.

FUTURE DIRECTIONS

The City will need to rely on several mechanisms to address hazards identified in the Geotechnical Element. These include the regulations and guidelines set forth in the State CEQA Statutes and Guidelines, Development Code, the Uniform Building Code, and the Subdivision Ordinance. The development review process must assure that development proposals are thoroughly evaluated with regard to geotechnical and seismic safety, that all necessary special studies are conducted and reviewed, and that comprehensive mitigation measures are developed and implemented.

The City should also work with State, regional, and County agencies to establish and maintain an up-to-date information database on geotechnical and seismic conditions in the region, legislation affecting the City's regulatory responsibilities, and changing technical assessments that refine or recharacterize the geotechnical hazards affecting the region.

GEOTECHNICAL HAZARDS GOALS, POLICIES AND PROGRAMS

GOAL EH l

City of Big Bear Lake General Plan Environmental Hazards/Geotechnical

Minimized vulnerability to, and optimized protection of, the general health, safety and welfare of the community from the effects of geotechnical hazards that may impact lives, property and the economic wellbeing of the community.

Policy EH 1.1
Ensure that new development proposals are evaluated for potential geotechnical impacts and that these impacts are mitigated to an acceptable level.

Program EH 1.1.1
Maintain records in the Planning and Engineering Divisions of geotechnical and soils reports, maps, data available from County and State agencies, and other information as appropriate, and make this information available to project applicants and staff for use in designing and evaluating new development proposals.
Responsible Agency: Planning and Engineering Divisions
Schedule: Ongoing

Program EH 1.1.2
Require development proposals in areas that have the potential to experience geologic hazards such as settlement, rockfall, landslide, slope instability and/or liquefaction, to prepare a detailed geotechnical analysis and incorporate report recommendations into the project as appropriate. **Responsible Agency:** Planning and Engineering Divisions and reviewing authority
Schedule: Ongoing

Program EH 1.1.3
Review new development proposals (including single family residential uses) which are located in or immediately adjacent to areas with potential for soil instability, liquefaction and steep slopes to determine if significant constraints exist and to determine appropriate land use or hazard mitigation methods, and require compliance with any such measures identified.
Responsible Agency: Planning, Building and Safety, Engineering Divisions and reviewing authority
Schedule: Ongoing

Program EH 1.1.4
Maintain and apply the
City's Slope Density Ordinance (Ordinance 90-191), as it may be amended from time to time, to protect hillside areas from incompatible development and minimize adverse geologic impacts.
Responsible Agency: Planning and Building and Safety Divisions and reviewing authority **Schedule:**
Ongoing

Policy EH 1.2
Pursuant to applicable state laws, address the issue of non-single family unreinforced masonry structures which may be hazardous due to inadequate design or construction, while providing reasonable alternatives for property owners to consider, that are in compliance with seismic upgrade requirements.

Program EH 1.2.1
The City shall adopt an ordinance creating a rehabilitation program for non-residential unreinforced masonry buildings with the goal of rehabilitating older, non-compliant structures within five years after adoption of the ordinance. The program shall provide for, but not be limited to, any or all of the following: measures to strengthen buildings; measures to change the acceptable occupancy levels or to demolish the building; and incentives to repair buildings which are available through federal and state programs.
Responsible Agency: Building and Safety Division
Schedule: Ordinance adoption FY 2000-01; implementation ongoing

Policy EH 1.3
Encourage the rehabilitation of older (pre-dating 1991) commercial, industrial and institutional structures and public infrastructure and utility systems which are not constructed to withstand major seismic events.

Program EH 1.3.1
Provide information on rehabilitation of commercial, industrial and institutional structures which were not constructed to withstand major seismic events.
Responsible Agency: Building and Safety Division
Schedule: Ongoing

Policy EH 1.4
Cooperate and coordinate with other agencies to ensure that public infrastructure and utility systems are designed and maintained to reduce damage from seismic events, and to plan for response in the event of a failure of these systems.

Program EH 1.4.1
Establish and maintain working relationships with utility and service providers to coordinate efforts on long-range planning, facility upgrades, maintenance, and emergency response plans.
Responsible Agency: Public Works Division, Department of Water and Power, Planning Division, Fire Department
Schedule: Ongoing

Program EH 1.4.2
Encourage and cooperate with Caltrans, San Bernardino County, and appropriate public agencies, to stabilize susceptible slopes and strengthen bridges, and other structures along state highways which may be subject to failure during major seismic events.
Responsible Agency: Planning Division, City Engineer, Public Works Division
Schedule: Ongoing

Program EH 1.4.3
Continue to monitor progress, and cooperate with Caltrans in implementing the relocation or reconstruction of Highway 18 at the Bear Valley Dam as soon as practical.
Responsible Agency: Planning Division, City Engineer, City Manager's Office
Schedule: Ongoing

Policy EH 1.5
Prepare for response to a major seismic event through update and implementation of the City's Emergency Preparedness Plan, which will include strategies to inform and educate the public on earthquakes preparedness planning and response.

Program EH 1.5.1
As part of the City's Emergency Preparedness programs, coordinate with local utility companies, school, park and county service districts, the library, hospital, and other appropriate entities to provide emergency preparedness information to the general public regarding appropriate action before, during and after earthquakes and other disasters.
Responsible Agency: Fire Department, Planning Division, Building and Safety Division, City Engineer

Schedule: Immediate, Continuous

CHAPTER 2: FLOODING AND HYDROLOGY

PURPOSE

The Flooding and Hydrology Chapter of the Environmental Hazards Element sets forth the goals, policies and programs that are intended to address potential drainage and flooding hazards occurring within the community. The primary intent of this Chapter is to ensure the protection of the general health, safety and welfare of the community from potential flooding and associated hazards, by establishing a long-range plan for flood control and management of runoff. This element references and coordinates with other elements of the General Plan which also address threats to the lives and property of the community's residents. The potential and extent of the 100-year flooding threat is assessed, the 100-year storm being the highest magnitude storm expected to occur on average every 100 years. It is the intention of the community to plan and implement the phased development of flood control facilities, both project-specific and City-wide. Where feasible, the Chapter encourages joint use of drainage and flood control facilities with recreational uses and conservation of biological resources.

BACKGROUND

Elements directly related to Flooding and Hydrology include the Emergency Preparedness Chapter of the Public Services Element, which addresses the City's response to natural disasters. Also related, to a lesser extent, is the Geotechnical Chapter, which addresses associated liquefaction, erosion threats and water storage facilities. The Hazardous and Toxic Wastes Chapter is also related by potential of storm water runoff transporting hazardous and toxic materials stored on the surface and underground. Other related elements include the Land Use Element, which affects essential relationships of use to location-specific threats, and the Circulation Element, which defines the availability of and need for secure access and evacuation routes in the event of a major flooding threat to the community.

State policies and regulations require that the General Plans of counties and cities identify and offer mitigation measures for existing and potential flooding hazards in the area. Specifically, Chapter 73 of the Statutes of California, 1939, mandates the joint planning of area-wide drainage plans affecting local jurisdictions. Mapping areas subject to inundation in the event of dam failures is required pursuant to California Government Code Section 8589.5 and 65302(g). Government Code Section 8401 (c) requires that local governments plan, adopt, and enforce land use regulations for flood plain management. Known as the Cobey-Alquist Flood Plain Management Act, this legislation also sets forth requirements for receiving state financial assistance for flood control.

Mountain Conditions and Flood Hazards

The City of Big Bear Lake and the Big Bear Valley enjoy a Mediterranean type climate, typified by hot, dry summers and cool, moist winters, although these conditions can vary greatly due to topography. The coolest month of the year is January with a mean monthly temperature of 32.4°F. The warmest month is July with a mean monthly temperature of 63.8°F. The area's watershed is

Mountainous with steep upper slopes leading to a mildly sloping valley. The surrounding mountains receive up to 35- 45 inches of rainfall per year. Precipitation at Big Bear Lake's National Weather Service station from 1960 to 1995 averaged about 18 inches for each six-month season from October to March.

Potential flooding problems in the City of Big Bear Lake are related to a rise in the water level of Rathbun Creek, and other drainage courses as identified in the Master Plan for Drainage, and to storm flooding in the alluvial fans and terraces located at the base of the mountains in the southern portions of the plan area. Since flow in the plan area drainages is intermittent, the channels can easily be clogged by debris. When a heavy rainstorm or rapid snowmelt occurs, a channel may overflow.

Regional Flood Control

Storm drainage and flood control facilities in the City of Big Bear Lake are maintained and serviced jointly by the City of Big Bear Lake Public Works Division and the San Bernardino County Flood Control District. Each jurisdiction is responsible for segments of the existing facilities, as well as watershed and watercourse protection related to those facilities. To carry out its mandate, the District also has powers of taxation, bonded indebtedness, land and water rights acquisition, and cooperative partnerships with local, state and federal agencies. An elected Board acts as the official decision-making body of the District.

Local Drainage Management

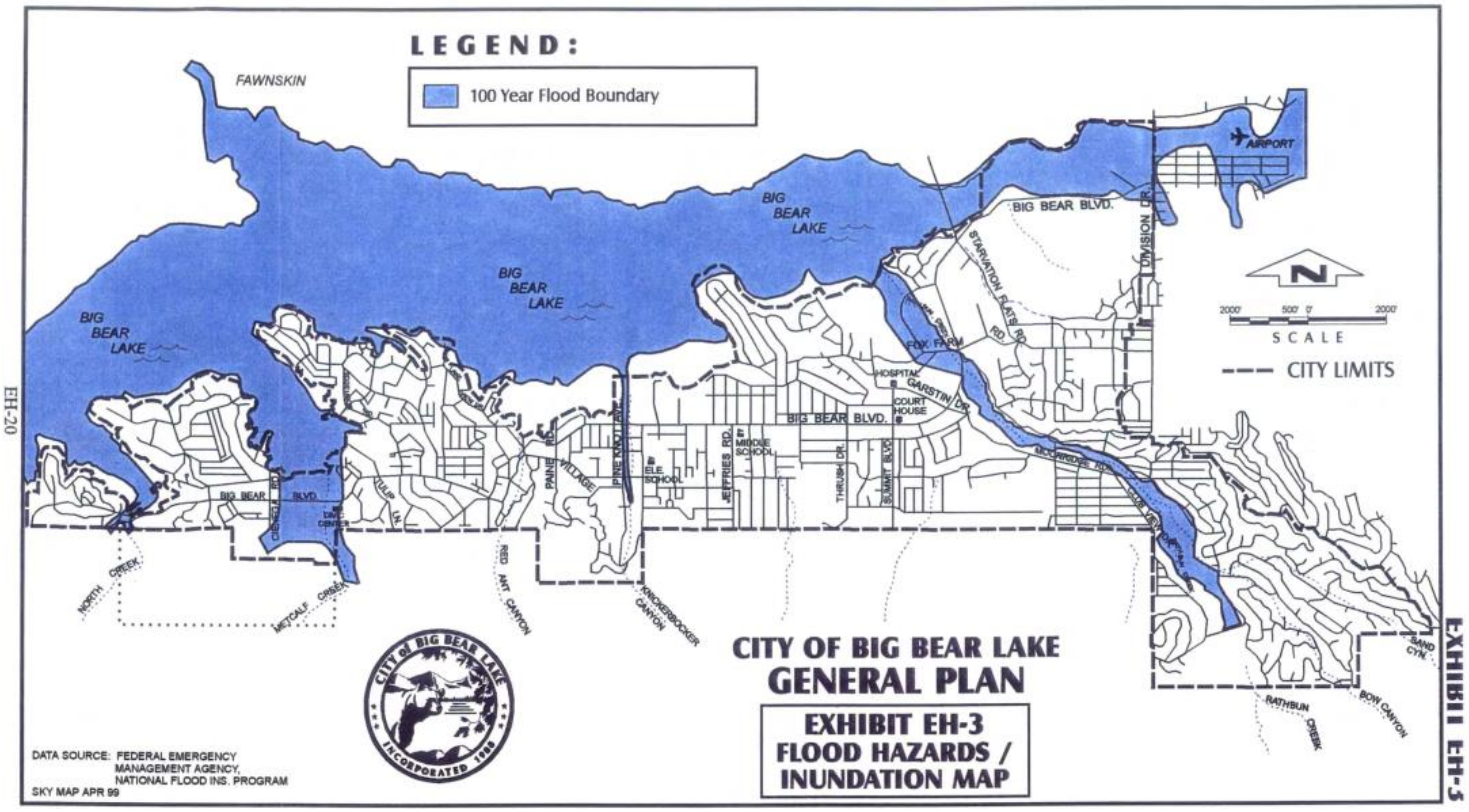
The effectiveness with which the City manages drainage issues will have a direct effect on the scale, complexity and cost of future flood control facilities. The cost-effectiveness of prevention and on-site management is actively integrated into community land use planning and regulation, which recognizes significant constraints in many areas of the City. The most cost-effective solutions to flood hazards are good watershed management practices, which decrease the amount and rate of flow, and prudent land use planning to limit the number of structures and people located in prone areas.

The preservation of lands constrained by topography or drainage, including steep slopes, areas rich in vegetation and cover, and alluvial plains and drainage channels greatly reduces runoff and preserves the capacity of downstream facilities. Furthermore, the planned integration of on-site storm water detention facilities, where possible and appropriate, significantly reduces the needed size of downstream facilities, while creating opportunities for enhanced open space and/or recreation areas.

FEMA and the Federal Flood Insurance Rate Maps

Many of the areas of the United States subject to flooding from 100-year storms have been mapped by the Federal Emergency Management Agency (FEMA). The most widely distributed flood map

Exhibit EH-3-Flood Hazards/Inundation Map



Is the Flood Insurance Rate Map (FIRM). Flood risk data presented on FIRMs are based on historic, meteorologic, hydrologic and hydraulic data, as well as open-space conditions, flood control works and development.

Both Big Bear Lake and Rathbun Creek have flood plain zoning to restrict development of flood hazard areas. The General Plan area is subject to flooding along the several streams and natural drainage courses. There is also flooding potential along Pine Knot Boulevard and in the northeast comer of the City extending eastward into Big Bear City. The approximate 100-year flood zone boundaries are shown for all flooding areas in Exhibit EH-3. The 100-year flood zone for Rathbun Creek is generally confined along the channel. However, potential 100-year flood areas extend to several residential streets. In addition, Big Bear Boulevard (State Route 18) crosses each potential flood area. This could potentially restrict travel through the areas during a flood. Flooding along Rathbun Creek can reach depths ranging from 5 to 17 feet deep for the 100-year flood. The areas from Elm Street to Big Bear Lake would be the most severely affected along Rathbun Creek.

Each of the applicable flood zones are briefly described below.

A: Areas of 100-year flood; base flood elevations have not been determined.

AO: Special Flood Hazard Areas inundated by types of 100-year shallow flooding where depths are between 1. 0 and 3. 0 feet; depths are shown, or areas of 100-year alluvial fan flooding, depths and velocities shown, but no flood hazard factors are determined.

B: Areas between limits of the 100-year flood and 500-year flood; or certain areas subject to 100-year flooding with average depths less than one (1) foot or where the contributing drainage area is less than one square mile; or areas protected by levees from the base flood.

C: Areas lying outside the boundaries of the 100-year and 500-year flood plains and generally considered safe from flooding.

Flood waters have been computed to move at high velocities, with the potential to do considerable damage. Peak discharge is calculated at 11,000 cubic feet per second (cfs) at the mouth of Rathbun Creek (Table IV -1). The flood hydrographs and peak discharges for the 100-year flood on Rathbun Creek were computed based on a 24-hour general rainstorm.

Exhibit EH-3 shows the boundaries of the 100-year flood plain as contained on the Flood Insurance Rate Maps prepared for Big Bear Lake dated March 18, 1996. It should be noted that the map shows generalized locations of potential flood hazards, and should not be considered as a definitive indication that hazards exist or do not exist in any particular location. City staff and project applicants will continue to be responsible for performing hydrologic and hydraulic analysis as required by engineering standards and the California Environmental Quality Act, where appropriate. In addition, the map is not intended to be used by the City to support requirements for additional analysis or mitigation, except where these requirements are deemed to be appropriate based upon

conditions on the project site, available data and review by appropriate agencies at the time the project is proposed.

Table EH-1
Summary of Peak Discharges for Rathbun Creek
(FEMA, 1991)

Flooding Sources and Location (100 year)	Drainage Area (sq. Mile)	Peak discharge (cfs)_
Rathbun Creek		
at Big Bear Lake	6.37	11,000
at State Route 18	6.02	10,800
at Moonridge Road	3.34	7,200
at Lassen Drive (tributary channel)	.82	1,200

Facilities

Capital projects such as dikes, levees, channels, and debris and detention/retention basins are often constructed to manage project-specific, community and regional drainage systems in the community. Designing, financing and construction of these facilities offers significant challenges, as well as opportunities. Approaches to flood control and their costs are weighed against the economic impacts likely to result from major flooding. Flood control improvements are frequently necessitated by development itself, which creates its own runoff management problems.

Rathbun Creek is the only major flood control facility in the General Plan area, which is only partially maintained by the San Bernardino County Flood Control District. It is predominantly an earthen unimproved drainage channel and is currently inadequate in areas to contain 100-year storm flows. As drainage improvements are planned for the City, adequate flood control design must also include efforts to maintain the integrity and health of the area's environmental resource. The City has no coordinated storm drainage system perse, although street drainage pipes are located throughout the City. Additionally, design engineering of future major detention/retention facilities will need to focus on the seismic hazards of the area when planning for and constructing these facilities. The City's Master Plan for Drainage, completed in 1999, outlines improvements needed to address flood control throughout the City. These improvements will be included in the Capital Improvement Program and will be constructed as funds become available.

Seismically Induced Inundation

Seismically induced inundation refers to flooding as a result of water retention structures, such as reservoirs, failing during an earthquake. Flood control and reservoir facilities could pose an inundation hazard if they contain water at the time of the seismic event, or if they are not repaired soon after an earthquake and prior to the next wet season. Seismically induced inundation canals occur if strong ground shaking causes structural damage to above- ground water tanks. However, the City's Department of Water and Power recently had all water tanks in the City inspected and the tanks have received upgrades to minimize this risk.

Inundation from Seiches

Big Bear Lake may be subjected to seiching as a result of an earthquake. A seiche is a free or standing-wave oscillation of the surface water in an enclosed or semi-enclosed basin such as a lake, bay or harbor (see Geotechnical Element). Although disturbance of the surface of Big Bear Lake as a result of the June 28, 1992, Big Bear earthquake was reported at a scale of several inches, no damage from flooding was reported. The degree of inundation would vary depending on the duration and period, or direction, of earthquake shaking.

Bear Valley Dam

Big Bear Lake and its Dam have a storage capacity of 7 3,000-acre feet, a crest height of 72.3 feet and a spillway capacity of 1,500 cfs. The lake level is maintained at an elevation of 6,743.2 feet above mean sea level, which matches the dam crest height. Excess water is released into the stream below. The local snow pack is currently not monitored, so that no analysis of its potential impact on the Lake is performed. Management of the lake level is essential in protection of surrounding lands from the potential for inundation.

The dam at Big Bear Lake is constructed of concrete, with foundation materials of intrusive granitic rock. Concrete dams, when well-constructed and sited, have traditionally been the most resistant to earthquake damage. The dam was seismically retrofitted prior to the 1992 earthquake and performed well under the intense ground shaking of this event, with no damage reported. However, in the unlikely event of a catastrophic failure of the Bear Valley Dam, significant impacts to downstream communities, including the City of Redlands, can be expected.

Land Use Planning as a Flood Control Strategy

One of the most effective and direct methods of controlling flooding and limiting threats to lives and property is proper land use planning. Consistent with other primary goals of the community, land use planning can call for the preservation of natural vegetation in the foothills and mountains, which function as natural water sheds for local drainage and ground water recharge, and can affect the volume of storm water and debris that reach downstream facilities.

EH-23
Resolution No. 99-36, 8/23/99

Land use planning can also limit the exposure of people and improvements to storm hazards and damage. Restrictions on the type and location of structures in the vicinity of major drainages within the community can greatly reduce potential losses. Within the limits of improved and unimproved 100-year flood plains, development should be limited; however, these areas can be used for recreation, water recharge, conservation, or other similar uses.

Within flood zones subject to sheet flooding, development approvals should be conditioned to assure protection of improvements from flood damage. Protection measures may include raising the finished floor level above the flood depth projected for the surrounding area and providing protection against scouring. Until such time as flood protection is provided, which removes areas from severe threats of flooding, development in these areas should be carefully regulated.

Flood Control and Wildlife

Natural drainage channels provide important habitat for a wide range of wildlife within the General Plan area (see Biological Resources Element). The City is faced with the long-term challenge of balancing the need to preserve wildlife habitat, while protecting the lives and property of its citizens. Especially along Rathbun Creek, opportunities for habitat preservation should be evaluated when considering the design of additional flood control facilities.

FUTURE DIRECTIONS

The Flooding and Hydrology Chapter is implemented through the direct expression of policies and programs of this Chapter and through the implementation of other General Plan Elements, including the Environmental Resources, Open Space, Parks and Recreation, and Public Services and Facilities Element.

However, the principal and direct implementation of this Chapter will be through the enforcement and implementation of regional and City Master Drainage Plans. The Master Plans and their improvements help control and confine the area-wide drainage pattern to more discrete and focused routes where it can be better managed. It may also point to facilities that complement land use patterns, provide cost-effective flood control alternatives, and maximize opportunities for multiple uses, including enhanced ground water recharge. The Master Drainage Plans will also set critical parameters for future development along areas subject to area-wide flooding. This Chapter will also be implemented through the development guidelines and regulations of the Development Code, Grading Ordinance and Subdivision Ordinance.

FLOODING AND HYDROLOGY GOALS, POLICIES AND PROGRAMS

GOAL EH2

Minimized damage to property, infrastructure and the Lake and protection of public health and safety through development and implementation of flood control plans, review of new development and mitigation of potential drainage impacts.

Policy EH 2.1
Evaluate flood control needs in the City and develop and implement long-range plans for master storm drainage improvements, along with funding programs, in coordination with other affected agencies.

Program EH 2.1.1
Develop and adopt a Master Plan of Drainage which includes a prioritized listing of needed facilities, and include such facilities in the City's Capital Improvement Program.
Responsible Agency: City Engineer
Schedule: Adoption 1999; implementation ongoing

Program EH 2.1.2
Update the City's ordinances and engineering standards as needed to reflect the recommendations and facilities contained in the Master Plan for Drainage, which may include but not be limited to techniques for snow storage and standards to reduce the rate of runoff.
Responsible Agency: City Engineer
Schedule: Update standards FY 1999-2000; implementation ongoing

Program EH 2.1.3
Ensure that the City's drainage courses are regularly maintained and kept free of debris and obstructions to the extent allowed by environmental laws and restrictions.
Responsible Agency: City Engineer, Public Works Division
Schedule: Ongoing

Program EH 2.1.4
Implement public financing programs where feasible to provide for required drainage improvements and coordinate design and construction of flood control improvements with adjacent jurisdictions where appropriate.
Responsible Agency: City Engineer, City Council
Schedule: Ongoing

Program EH 2.1.5
Coordinate with the Forest Service to inform them of flooding problems within the City which result from conditions on National Forest land, and work with that agency to resolve these issues as needed.
Responsible Agency: Public Works Division
Schedule: Ongoing

Program EH2.1.6
The City shall cooperate in securing FEMA map amendments recognizing the appropriate redesignation of the 100-year flood plains within the City boundaries as needed.
Responsible Agency: City Engineer
Schedule: Ongoing as needed

Policy EH 2.2
Require that new development shall not be exposed to flood hazards or contribute to an existing flood hazard, in accordance with Master Plan of Drainage and other applicable regulations.

Program EH 2.2.1
Require that building foundations be a minimum of one (1) foot above the 100-year flood elevation, unless alternative diversion methods are approved by the City Engineer.
Responsible Agency: City Engineer
Schedule: Ongoing

Program EH2.2.2
Require development proposals in areas that have potential to experience flooding or cause additional stormwater flows to prepare a detailed hydrology study and incorporate report recommendations into the project as appropriate.
Responsible Agency: City Engineer
Schedule: Ongoing

Program EH2.2.3
Require that all required primary and secondary access routes for new development should be located outside of the 100-year flood plain or be designed to withstand a 100-year flood, to the extent feasible.
Responsible Agency: City Engineer and reviewing authority
Schedule: Ongoing

Program EH2.2.4
Ensure that new development complies with flood plain zoning and watershed management regulations.
Responsible Agency: City Engineer and reviewing authority
Schedule: Ongoing

Policy EH 2.3
Provide information to the public regarding flood plains, watershed management practices, flood insurance rate maps, minimizing pollution of surface waters, and other hydro logic issues as needed.

Program EH 2.3.1
Prepare and distribute information showing methods to prevent pollution of surface water runoff by point and non-point source pollutants, to promote protection of the watershed.
Responsible Agency: Planning Division, Building and Safety Division, Department of Water and Power
Schedule: Initiate in FY 1999-2000

Policy EH 2.4
Prepare for response to flooding through update and implementation of the Emergency Preparedness Plan, which will include evacuation and access plans for areas in which existing development is located within a 100- year flood plain.

Program EH 2.4.1
Emergency evacuation/access plans shall be developed for areas of the City where development already occurs within the 100-year flood plain.
Responsible Agency: Fire Department, Public Works Division, Planning Division, City Engineer
Schedule: FY 1999-2000 and ongoing

Program EH 2.4.2
Confer and consult with the Municipal Water District and Caltrans to assure adequate all-weather crossings/facilities at appropriate locations along State Highways surrounding the Lake, especially those serving as emergency evacuation/access routes.
Responsible Agency: City Engineer, Public Works Division
Schedule: Ongoing

Policy EH 2.5
Promote the joint use of flood control facilities for recreational uses and as natural open space, where feasible and appropriate.

Program EH 2.5.1
In development or review of proposed detention/retention basins, evaluate the potential for their use as play fields and implement joint use facilities where appropriate.
Responsible Agency: Engineering, Public Works, and Planning Divisions, City Council
Schedule: As needed and appropriate

Program EH 2.5.2
In plans to improve drainage courses for flood control, consider the feasibility of their use as open space corridors and recreational trails, and plan for these joint uses where feasible and appropriate. **Responsible Agency:** Planning, Engineering, and Public Works Divisions
Schedule: Ongoing

CHAPTER 3: HAZARDOUS AND TOXIC MATERIALS

PURPOSE

The Hazardous and Toxic Materials Chapter identifies issues pertaining to the use, storage and disposal of hazardous and toxic materials in the community, and describes the regulatory environment established to safely manage these materials. The intent of the Hazardous and Toxic Materials Chapter is to reinforce the City's concern and planning for the protection of all Big Bear Lake residents and visitors from diverse health and other impacts due to the presence of hazardous and toxic materials. The Chapter sets forth goals, policies and programs that will help assure an effective response to the use, storage, or transport of hazardous and toxic materials in the City of Big Bear Lake, and help ensure the general health, safety and welfare of the community from possible impacts associated with these materials.

BACKGROUND

The Hazardous and Toxic Materials Chapter is directly related to the Air Quality and Water Resources Chapter, as policies implemented for hazardous and toxic waste management will have an effect on preservation of clean air and protection against water resource contamination. It is also related to the Land Use Element since hazardous or toxic materials and their storage or disposal may affect land use compatibility, and site contamination impacts the future re-use potential of affected properties. The Emergency Preparedness Chapter has a direct relationship to the emergency management of these materials and their potential adverse impacts on the community as a result of spillage or upset. Resources addressed by the Biological Resources Chapter may also be affected by the improper management of these materials, especially herbicides and pesticides. The Fire and Police Protection Chapter also has a relationship to this element, in that the Fire Department conducts inspections of businesses which use these materials and responds to incidents involving hazardous materials, referring larger incidents to the appropriate agency.

California Government Code Section 65302(g) mandates that the General Plan of a community address safety issues, including but not limited to hazardous materials. Modem industrial society has generated a wealth of materials and technologies that have improved our quality of life but have also introduced new and potentially hazardous materials, which must be carefully managed. This Chapter discusses various issues associated with these hazardous and toxic materials and provides background information on how they are to be managed and discarded. Most potential hazardous materials problems in the Valley are associated with leaking fuel storage tanks, emissions from industrial and commercial solvents and coatings, and hazardous waste generated by households and commercial businesses. Although control and regulation of hazardous and toxic materials rest largely with county, state, and federal agencies, the City Fire Department plays a key role in monitoring local conditions and coordinating with the appropriate agencies to implement plans for hazardous material use and waste disposal.

In the City of Big Bear Lake, there are a variety of hazardous/toxic material generators associated with commercial, institutional and quasi-industrial uses, including auto repair, medical offices and facilities, painting contractors, contractors' storage yards and maintenance facilities, bulk sales of paints and solvents, print shops, photographic supplies, dry cleaners and other uses. In addition, a wide variety of products that are considered hazardous or toxic are used in households. Chemicals that might be expected to be found in the City include chlorine products, chemical fertilizers, herbicides and pesticides, stored fuels and waste oil, chemical solvents and lubricants, and products associated with nuclear medicine. If improperly handled and managed by service stations, petroleum product and equipment suppliers, pesticide vendors and users, automotive dealers, medical practitioners and hospitals and clinics, these materials could pose a significant potential threat to the community and its environment, even though most are considered "small quantity generators."

Bear Valley Community Hospital

Bear Valley Community Hospital is one of the substantial "small quantity generators" in the City. The hospital produces hazardous medical wastes associated with various procedures and treatments provided. Management and disposal of these materials is primarily the responsibility of the U.S. Environmental Protection Agency (EPA), with additional regulatory responsibility given to the California Office of Health Planning and Development and the San Bernardino County Fire Department, Hazardous Materials Division. Bear Valley Community Hospital has developed and implemented both a Medical Waste Management Plan and a Hazardous Materials Management Program, which set forth policies, programs and procedures for handling, storage, use and disposal of these materials. Wastes are stored in controlled conditions on-site and removed every ninety days, with storage typically limited to less than 100 gallons within that time period.

Ski Resorts

Two local ski resorts produce hazardous waste associated with the equipment used to maintain their large operations, including the waste oil from equipment and vehicle maintenance and fuel storage for snowmaking and lift operations. They also handle and store hazardous materials in underground fuel tanks. The State and EPA regulations mentioned above also apply for these operations.

Community Hazardous Waste Risks

In addition to the above-listed uses, there are other sites that have been or should be monitored. These include other waste-generating medical clinics and facilities, contractors' storage yards, vehicle maintenance facilities, automobile service stations, equipment and fuel storage yards, wrecking yards, and waste haulers.

According to the State of California Hazardous Waste and Substances Sites List prepared by the California Environmental Protection Agency, there are 17 sites listed within the City of Big Bear Lake, all of which are associated with underground fuel tanks. The U.S. EPA requires all service stations to retrofit or replace underground storage tanks with double-walled construction. According

to the San Bernardino County Fire Department, Hazardous Waste Division, all storage tanks installed prior to 1984 must be upgraded or removed to meet current regulations by December 22, 1998. Most sites in the City have already complied with this rule, and permits have been processed to upgrade the remaining tanks within the required timeframe.

Various industrial activities, including printers, drycleaners (although the chemicals now used by dry cleaners are not as toxic as they once were), paint stores, marinas, paving contractors, and automobile repair shops also have the potential for uncontrolled discharge of hazardous materials, and are permitted through the San Bernardino County Fire Department Hazardous Materials Division.

Hazardous Waste Disposal

Strong ground shaking caused by earthquakes can also set into motion hazards such as disruption of essential services, including sewer systems, and releases of hazardous materials can occur. The City is in the process of upgrading the sewer system, including pump stations, and these upgrades will address seismic hazards to minimize the risk of spills in the event of a major earthquake.

Hazardous Waste Management Plans

The City of Big Bear Lake has the opportunity to coordinate with appropriate county, state and federal agencies in the identification of sites where hazardous materials are used, and the Big Bear Fire Department will likely be the agency of first response in the event of a hazardous materials spill requiring cleanup. The Fire Department's capacity or authority is as a First Response Team; the agency responsible for the Hazardous Response Plan is the County of San Bernardino. Management strategies may include establishing and maintaining information on these sites, and periodic monitoring of facilities and operations that utilize or produce hazardous materials in the City. The County requires preparation and submittal of commercial business plans for uses which handle hazardous materials, and this information is shared with the Fire Department. Since the Fire Department conducts annual inspections of businesses within the City to review Fire Code compliance, the Department also has an opportunity to ensure that hazardous materials plans are being adequately followed. The Department may also be involved in monitoring and regulating of underground storage tanks and regulating the transport of hazardous materials through the community.

In order to comply with Health and Safety Code Section 2513 5, the San Bernardino County HWMP (Hazardous Waste Management Plan) assures that adequate treatment and disposal capacity is available to manage the hazardous wastes generated within the jurisdiction, and addresses issues related to manufacture and use. At the planning level, the City currently requires that projects which are approved comply with the HWMP. AB 2948 (Chapter 1504, Statutes of 1986), commonly known as the Tanner Bill, authorizes counties to prepare HWMP in response to the need for wise management of hazardous materials and waste products. The County HWMP identifies the types and amounts of wastes generated in the County and establishes programs for managing these wastes. Preparation of the HWMP included extensive public participation. Its policies call for the coordination of County efforts with state and federal agencies in the identification and establishment of programs for managing these wastes. The City has also adopted a Hazardous Waste and Source Reduction and Regulation Plan, which sets forth policies and programs for the management, control and reduction of hazardous wastes. This plan was developed jointly by the County, the City of Big Bear Lake, and other cities within the County, the State, the public and industry to address the disposal, handling, processing, storage and treatment of local hazardous materials and waste products.

The California Regional Water Quality Control Board (CRWQCB), in conjunction with the Big Bear Lake Department of Water and Power, maintain information concerning contaminated wells and groundwater. The state and federal Environmental Protection Agency (EPA) and the State Department of Health also supply information concerning specific hazardous waste sites and their locations. Private database screening and documentation services are also available, which will search, extract, and summarize reports on contaminated sites recorded in various state and federal databases.

Hazardous Materials Response

To abate hazardous and toxic materials that are determined critical by the State of California Department of Toxic Substance Control, the County Fire Department Hazardous Materials Division and the City can require property owners to test, temporarily close and/or remove all hazardous liquids, solids or sludge located on a site. Leaking underground storage closure and monitoring are generally required by the site's operating permit. When soil contamination is detected, the cleanup procedure to be followed, the degree or level of cleanliness required by the regulator, and the method of treatment (if permitted) will be directed by the County Fire Department Hazardous Materials Division and/or the Regional Water Quality Control Board.

Review of New Hazardous Materials Users

The City has the opportunity to identify new development proposals which will use hazardous materials at two stages of the review process: when a business license is applied for, and when a new

development proposal is reviewed by the Development Review Committee. At the business license stage, the City staff can inform the applicant of hazardous materials permit requirements and procedures, directing the applicant to the proper agency for permit applications. During plan review of new structures or alterations to existing structures, the Fire Department and Building and Safety Division can review what materials are proposed to be stored on the site and ensure that proper measures for safe handling are incorporated into the building construction.

FUTURE DIRECTIONS

The City of Big Bear Lake has the responsibility to coordinate with the appropriate agencies in monitoring the use of hazardous materials within the City, and responding to events requiring clean- up of these substances. This element can most efficiently be implemented through regular consultation with the RWQCB and the County Fire Department Hazardous Materials Division, by maintaining information on businesses which use hazardous materials, and monitoring facilities to ensure that they have approved business plans and that they are in compliance with these plans. The City should also remain current regarding the monitoring and regulating of fuel and hazardous material storage tanks, and regulating the transport of hazardous materials through the community.

A carefully coordinated program of oversight and management between responsible agencies will be essential. Regular consultation and coordination between the City Emergency Preparedness personnel and responsible county and state agencies is also appropriate. Processes for determining appropriate levels of local, County and State personnel and facilities will also be critical. The goal, policies and programs of this element help to direct the planning and development of appropriate strategies to address hazardous and toxic materials in the community.

HAZARDOUS AND TOXIC MATERIALS GOAL, POLICIES AND PROGRAMS

GOAL EH3

Ensure the safety of residents, businesses, and visitors in the City of Big Bear Lake through monitoring and coordinated enforcement, with other agencies, of regulations pertaining to the production, transport, use, and disposal of toxic and hazardous materials.

Policy EH 3.1
Coordinate with other agencies as appropriate to monitor businesses which use hazardous materials and to ensure a timely response to any events which require clean-up of these materials.

Program EH 3.1.1
Through the development review process, identify uses which propose the manufacture, storage, use and/ or disposal of significant quantities of hazardous and toxic materials within the community, and require that these projects obtain a conditional use permit and comply with the County Hazardous Waste Management Plan.
Responsible Agency: Planning Division, Development Review Committee, reviewing authority and Fire Department
Schedule: Ongoing

Program EH3.1.2
Coordinate with appropriate departments and agencies to establish transportation management and contingency emergency procedures and training programs for police, fire, medical and other organizations that would be involved in an airborne release or ground spill of hazardous and toxic materials or waste.
Responsible Agency: Public Works Department, Fire Department, Sheriff Department
Schedule: Ongoing

Program EH 3.1.3
Coordinate with San Bernardino County to obtain copies of business plans addressing the use of hazardous materials within the City, and review proper handling and storage procedures with business owners as part of the annual business inspection program.
Responsible Agency: Fire Department
Schedule: Ongoing

Policy EH 3.2
Facilitate the safe and immediate cleanup of all existing and future hazardous waste sites within the City of Big Bear Lake.

Program EH 3.2.1
Coordinate with the appropriate state and federal agencies to activate procedures for the cleanup of existing and future hazardous and toxic waste sites within the planning area.
Responsible Agency: Building and Safety Division, Fire Department, other agencies as appropriate
Schedule: Ongoing

Policy EH 3.3
Cooperate with the responsible agencies to assist and facilitate the safe and responsible disposal of all hazardous and/or toxic wastes in compliance with existing federal, state and county regulations.

Program EH 3.3.1
Prepare and/or disseminate information and instructive education program materials including direction on the identification and proper management of household hazardous waste.
Responsible Agency: Planning Division, Public Works Division, Fire Department
Schedule: Ongoing

Program EH 3.3.2
Continue to make a household hazardous waste collection site available to residents within the City, and evaluate expanding this service to handle small business generators of hazardous waste.
Responsible Agency: Fire Department, Public Works Division
Schedule: Ongoing

APPENDIX F

[ON FOLLOWING PAGE]

APPENDIX F

ORDINANCE NO. 2019-475

AN ORDINANCE OF THE CITY OF BIG BEAR LAKE, COUNTY OF SAN BERNARDINO, STATE OF CALIFORNIA, REPEALING ORDINANCE 2016-453 AND 2008-383 AND ADDING AND AMENDING TITLE 8 AND 15 OF THE BIG BEAR LAKE MUNICIPAL CODE PERTAINING TO THE CONSTRUCTION AND MAINTENANCE OF BUILDINGS, HOUSING, ABATEMENT OF DANGEROUS BUILDINGS, AND FIRE PREVENTION BY ADOPTING THE 2019 CALIFORNIA BUILDING STANDARDS CODE AS FOUND IN TITLE 24 OF THE CALIFORNIA CODE OF REGULATIONS COMPRISING THE CALIFORNIA BUILDING CODE, VOLUMES 1 & 2, AND APPENDICES B, H, & J OF VOLUME 2, 2019 EDITION; THE CALIFORNIA RESIDENTIAL CODE AND APPENDICES H & O, & V, 2019 EDITION; THE CALIFORNIA ELECTRICAL CODE, 2019 EDITION; THE CALIFORNIA MECHANICAL CODE, 2019 EDITION; THE CALIFORNIA PLUMBING CODE, 2019 EDITION; THE CALIFORNIA ENERGY CODE, 2019 EDITION; THE CALIFORNIA HISTORICAL BUILDING CODE, 2019 EDITION; THE CALIFORNIA GREEN BUILDING STANDARDS CODE, 2019 EDITION; THE CALIFORNIA FIRE CODE AND APPENDICES CHAPTER 4, A, B, BB, CC, D, H, I & J AND ERRATA, 2019 EDITION; THE CALIFORNIA EXISTING BUILDING CODE, 2019 EDITION; THE CALIFORNIA REFERENCE STANDARDS CODE, 2019 EDITION; THE INTERNATIONAL PROPERTY MAINTENANCE CODE, 2018EDITION.

WHEREAS, Government Code Sections 50022, et seq. and California Health & Safety Code Section 17922 empowers the City of Big Bear Lake ("City") to adopt by reference the California Building Standards Code as found in Title 24 of the California Code of Regulations; and

WHEREAS, in 2016 the City Council adopted Ordinance 2016-453 adopting the 2016 California Building Standards Code with certain amendments; and

WHEREAS, in 2016 the City Council adopted Ordinance 2016-453 amending the 2016 California Building Standards Code to require fire-resistive construction; and

WHEREAS, in 2016 the City Council adopted Ordinance 2016-453 amending the 2016 California Building Standards Code to require additional snow load requirements; and

WHEREAS, in 2008 the City Council adopted Ordinance 2008-383 adopting the 1997 Uniform Code for the Abatement of Dangerous Buildings

WHEREAS, the California Building Standards Commission recently adopted new amendments to the California Building Standards Code; and

WHEREAS, California Health & Safety Code, Section 17958.5 authorizes cities and counties to modify the California Building Standards Code by adopting more restrictive standards and modifications if such standards and modifications are accompanied by express findings that they are reasonably necessary because of local climatic, geological or topographical conditions; and

WHEREAS, the City Council finds and determines that certain local climatic, geological or topographical conditions applicable to the City include, but are not limited to, the following:

(a) The City has a rural setting with many structures located on parcels such that their distance from the public right-of-way make it difficult for the address of the posted premises to be visible from the public right-of-way. Additionally, the absence of street lighting within significant portions of the City makes it difficult for emergency personnel to identify premises address numbers posted on structures. Therefore, it is reasonable to require the posting of an additional street address number sign adjacent to the property entrance when structures on the property are long distances from the public right-of- way. It is also reasonable to require internally illuminated street address number signs on structures located within the City and therefore amend Section 501 of the California Building Code to require illuminated street addressing.

(b) The City is located in an area, which due to its topography is highly susceptible to fires, strong winds and extreme weather conditions such as wind driven rain and snow. In other communities these similar climatic and vegetation conditions have contributed to the loss of or injury or damage to life and property, including 18,804 structures in the Camp fire of 2018 which destroyed the City of Paradise, 5,643 structures in the Tubbs fire,1063 in the Thomas fire of 2017, and 783 structures in the Atlas fire of 2017. Since 2003, 1531 homes have been destroyed in the foothills and mountains of San Bernardino County; 993 in the Old Fire, 262 in the Slide Fire, 175 in the Grass Valley Fire, and, 96 in the Blue cut Fire. 100's of deaths has occurred due to these fires besides the loss of structures. It is reasonable to require exterior walls, roof eaves, exterior decks, roof ventilators, attics and under-floor areas of residential construction to meet a higher level of fire-resistive construction standards than the fire- resistive construction standards applied to residential construction elsewhere in California. Therefore, it is reasonable to amend Chapter 7A of the 2019 California Building Code and Section R337 of the 2019 California Residential Building Code to require eave, cornice, ridge and gable end roof ventilators and under-floor ventilators to be listed by the ventilator manufacturer as being resistant to the intrusion of flame and burning embers.

(c) According to the Big Bear Fire Authority ("Authority"), based on the California Building Code Standards 2019 edition, Standard 15-2, Class "A" roofing affords a much greater degree of fire protection which is more appropriate than Class "B" roofing for the peculiar weather conditions of the City. Fires occurring in homes with Class "B" roofing place a greater demand on Authority Firefighters than fires occurring in homes with Class "A" roofing and as such, diminish the Authority's ability to control and prevent the spread of fire to surrounding property and structures. Therefore, based on the City's climatic, geology and topographic conditions, it is reasonable to require all structures to be constructed with "Class A" roofing material and therefore amend Section 1505 of the 2019 California Building Code and Section R905 of the California Residential Building Code.

(d) Existing wood shingle and wood shake roofs were installed prior to the implementation of requirements for installations within severe climate areas. Additionally, existing

wood shingle and wood shake roofs provide for poor anchorage of fasteners intended to anchor new roof materials, as the fasteners split the weathered and brittle wood shingles and shakes. Therefore, it is reasonable to prohibit the installation of new roofing over existing wood shingle or wood shake roofs even though this practice is permitted elsewhere in California and therefore amend Section 1511 of the 2019 California Building Code and Section R908 of the 2019 California Residential Code.

(e) The City is located in an area, which due to its climate is susceptible to variable rates of snowfall during the year. The climatic conditions of the City require that the Building Official establish snow load requirements for buildings constructed within the City as specified in the California Building Code. Therefore, the Building Official has determined on the basis of the review of empirical data related to snow fall levels in the area, contacts with local engineering and architectural firms that perform construction design within the City, and the Contractor's Advisory Board, and there is a consensus, that in order to ensure the public safety, requirements within the City should be a minimum roof snow load of 100 pounds per square foot or a ground snow load of 85 pounds per square foot in accordance with the provisions of Section 1608 of the 2019 California Building Code and Table R301.2(1) Climatic and Geographic Design Criteria of the 2019 California Residential Code.

(h) The City being in an area subject to high fire hazard and substantial snow accumulation has a need to insure that all structures exempt from building permits are constructed to reduce the spread of wildfires and withstand increased roof loads. Therefore, to insure that these exempt structures meet minimum fire resistive design standards and snow accumulation conditions it is reasonable to amend Chapter 1 Section 105 of the 2019 California Building Code and Chapter 1 Division II Section R 105 of the 2019 California Residential Code.

(i) The City is contracted with the Big Bear Fire Authority for the purpose of fire suppression and wishes to establish consistency in the administration and enforcement of the California Code of Regulation Title 24 California Building Codes Parts 1 through 8, Part 9 Chapters 6, 7, 8 and 9, Part 10 and part 12 as they apply to building plan review and building inspection. Therefore, it is reasonable to designate the Building Official as the Fire Code Official for the enforcement and of the codes by amending section 202 of the California Fire Code 2019 edition.

NOW, THEREFORE, the City Council of the City of Big Bear Lake does ordain as follows:

Section 1. Findings. To the extent that the following changes and modifications to the Codes are deemed more restrictive that the standards contained in the California Building Codes thus requiring that findings be made pertaining to local conditions to justify such modifications, the City Council hereby finds and determines that the following changes and modifications are reasonably necessary due to local climatic, geological and topographical conditions.

Section 2. Section 15.04.010 of the City of Big Bear Lake Municipal Code is hereby amended in its entirety to read as follows:

15.04.10 Adoption of the California Code of Regulations.

The City adopts by reference and makes part of this Chapter by reference, subject to those certain amendments set forth in Section 15.04.020, the following California Building Codes and International codes (one copy of each is on file for use and examination by the public in the Office of the City Clerk):

A. California Administrative Code, Title 24 Part 1
B. California Building Code Volumes 1&2 and Appendix Chapters B, H, I, & J of Volume 2, 2019 edition, Title 24 Part 2;
C. California Residential Building Code and Appendix Chapters H, O, & V, 2019 edition, Title 24 Part 2.5;
D. California Electrical Code 2019 edition, Title 24 Part 3;
E. California Mechanical Code 2019 edition, Title 24 Part 4;
F. California Plumbing Code 2019 edition, Title 24 Part 5;
G. California Energy Code 2019 edition, Title 24 Part 6;
H. California Historical Building Code 2019 edition, Title 24 Part 8;
I. California Fire Code and Appendices Chapter 4, A, B, BB, C, CC, D, H, I & J and errata, 2019 edition Title 24, Part 9;
J. California Existing Building Code 2019 edition, Title 24 Part 10;
K. California Green Building Standards Code 2019 edition, Title 24 Part 11;
L. California Referenced Standards Code 2019 edition Title 24 Part 12;
M. International Property Maintenance Code, 2018edition.

Section3. Section 15.04.020 of the City of Big Bear Lake Municipal Code is hereby amended to read in its entirety as follows:

15.04.20 Amendments to the California Code of Regulations.

The following amendments to the 2019 California Code of Regulations are adopted to read as follows:

A. Chapter 1 Section 105.2 of the California Building Code and Chapter 1, Division II Section R105.2 of the 2016 California Residential Code is amended to read as follows:

"105.2 Work exempt from permit. Exemption from permit requirements of this code shall not be deemed to grant authorization for any work to be done in any manner in violation of the provisions of this code or any other laws or ordinances of this jurisdiction including but not limited to the City of Big Bear Lake Development Code. Permits should not be required for the following:

A Building Permit is not required for the following:

1. One story detached accessory structures to a Group R-3 occupancy used as tool and storage sheds, playhouses/treehouses, gazebos, and other similar non-habitable structures, provided the floor area does not exceed 120 square feet (11m2). These accessory structures shall not exceed 10' to the peak of the roof from grade level.

2. Non-masonry fences not over 6 feet (1829 mm) high.

3. Oil derricks.

4. Retaining walls that are not over 4 feet (1219mm) in height measured from the bottom of the footing to the top of the wall, unless supporting a surcharge, impounding Class I, II or IIIA liquids or retaining oils greater than 18 inches (457 mm) in depth at greater than a 2:1cutslope.

5. Water tanks supported directly on level compacted grade if the capacity does not exceed 5,000 gallons (18,927 L) and the ratio of height to diameter or width does not exceed 2 to1.

6. Sidewalks and driveways, not more than 30inches (762mm) above adjacent grade not exceeding a1in 8 slope (12.5 percent grade), not adjacent to a slope greater than 1in 2, not located over any basement or story below and not part of an accessible means of egress or an accessible route as defined by Chapter 11A and 11B of California Building Code.

7. Painting, papering, tiling, carpeting, cabinets, counter tops and similar finish work that does not alter an accessible means of egress or an accessible route as defined by Chapter 11A and 11B of California Building Code.

8. Temporary motion picture, television, and theater stage sets and scenery.

9. Prefabricated swimming pools accessory to a GroupR-3 occupancy that are less than 24 inches (610mm) deep, do not exceed 5,000 gallons (18,925 L) and are installed entirely aboveground.

10. Shade cloth structures constructed for agricultural purposes, not including service systems.

11. Swings and other playground equipment accessory to a Group R-3occupancy.

12. Window awnings in Group R-3 and U occupancies, supported by an exterior wall that do not project more than 24 inches (609.6 mm) from the exterior wall. 0. Non-fixed and movable fixtures, cases, racks, counters, and partitions, not over five feet nine inches (1753 m) in height and not placed in the accessible means of egress or an accessible route as defined by Chapter 11A and 11B of the California Building Code.

13. Decks accessory to a Group R-3 occupancy not exceeding 200 square feet (18.58 m2) in area, that are not more than 30 inches (762 mm) above natural grade at any point, are not within 10 feet (9.29m) of a dwelling, and do not serve the exit door required by Section R311 of the California Residential Building Code.

FPN: Forced Air Units, Water Heaters, and Windows are no longer exempt from permits as adopted in previous versions of the BBMC section 15.04.020.

An Electrical Permit is not required for the following:

1. Listed cord-and-plug connected temporary decorative lighting installed for a period of less than 90 consecutive days or as approved by the Building Official.

2. Reinstallation of attachment plug receptacles and lighting devices but not the outlets therefore.

3. Replacement of branch circuit over current devices of the required capacity in the same location.

4. Electrical wiring, devices, appliances, apparatus, or equipment operating at less than 25 volts and not

capable of supplying more than 50 watts of energy.

5. Electrical equipment used for radio and television transmissions, but do apply to equipment and wiring for a power supply and the installations of towers and antennas.

6. Temporary installations of systems required for testing or servicing of electrical equipment or apparatus.

7. Minor repair work, including the replacement of lamps or the connection of approved portable electrical equipment to approved permanently installed receptacles.

A Mechanical Permit is not required for the following:

1. Portable heating and cooking or clothes drying appliances.

2. Portable ventilation appliances.

3. Portable cooling units.

4. Steam, hot-or chilled-water piping with in any heating or cooling equipment regulated by this code.

5. Replacement of any minor part that does not alter approval of equipment or make such equipment unsafe.

6. Portable evaporative coolers.

7. Self-contained refrigeration systems containing10 pounds (4.54kg) or less of refrigerant or that are actuated by motors of 1 horsepower (746 W) or less.

8. Portable-fuel-cell appliances that are not connected to a fixed piping system and are not interconnected to a power grid.

A Plumbing Permit is not required for the following:

1. The stopping of leaks in drains, water, soil, waste or vent pipe; provided, however, that if any concealed trap, drainpipe, water, soil, waste or vent pipe becomes defective and it becomes necessary to remove and replace the same with new material, such work shall be considered as new work and a permit shall be obtained and inspection made as provided in this code.

2. The clearing of stoppages or the repairing of leaks in pipes, valves or fixtures, and the removal and reinstallation of water closets, provided such repairs do not involve or require the replacement or rearrangement of valves, pipes or fixtures.

B. Chapter1, Section 105.2 of the California Building Code and Chapter1, Division II SectionR105.2of the 2016 California Residential Code is amended to read as follows:

105.5 Expiration. Every permit issued shall become invalid unless the work on the site authorized by such permit is commenced within 12 months after its issuance, or if the work authorized on the site by such permit is suspended or abandoned for a period of 180 days after the time the work is commenced. Beginning January 1, 2020, every permit issued by the Building Official under the provisions of this

Code shall expire by limitation and become null and void if all work by said permit is not completed within 36 months from the date of issuance of the building permit.

(1) Before such work can be recommenced, a permit extension, as specified in Subsection A, shall be first obtained. No permit shall be extended more than twice.

(0) Time limits will not be increased by issuance of subsequent building permits for the same project.

(1) When a project is divided into separate permits by the applicant, the work on such permits is to be done concurrently, the time allowed to complete all work on each separate permit shall be established from the initial permit issuance date.

(A) Extensions and Fees.

a. Any permittee holding an active permit may apply in writing for an extension of the time within which work under that permit may be continued when, for good and satisfactory reasons, he or she is unable to continue work within the time required by this section due to circumstances beyond the control of the permittee. The written request must demonstrate that:

   i. Due to circumstances beyond the owner's or permittee's control, construction could not be commenced, continued or completed in the authorized time period, If the construction has started, substantial progress has been made,
   ii. The condition of the property presents no health or safety hazard, and, the continued delay will not create any unreasonable aesthetic impact to the neighborhood or substantial economic detriment to the neighboring property owners.

b. The Building Official may extend the time for action by the permittee for a period not exceeding six calendar months. Payment of the building permit extension fee shall be required. The extension fee shall be calculated as the greater of two percent (2%) of the estimated total project valuation or five-hundred dollars, whichever is greater.

c. Building permits shall not be extended more than twice, and each extension shall not exceed six months.

C. Section 501.2 of the California Building Code and Section R319 of the California Residential Code are amended to read as follows:

"Approved numbers or addresses shall be provided for all new buildings in such a position as to be plainly visible and legible from the street or road fronting the property. Address numbers and internal illumination shall be maintained.

The addresses for new dwellings shall be posted with a minimum of four inch (4") high numbers with proportionate width that are plainly visible from the street. During hours of darkness, the numbers shall be internally illuminated. Posted numbers shall be placed on a contrasting background. Where building setbacks exceed one hundred feet (100') from the street or road fronting the property, additional contrasting four inch (4") high numbers shall be displayed at the property entrance.

The addresses for new multi-family, new commercial and new industrial buildings shall be posted with a minimum of six-inch (6") high by three-quarters inch (3/4") stroke numbers. During the hours of darkness, the numbers shall be electrically illuminated. Where the building setback exceeds 200 feet from the roadway, additional non- illuminated contrasting six-inch (6") high by three-quarters inch (3/4") stroke numbers shall be displayed at the property entrance. New multi-family, new commercial and new industrial buildings shall display address/suite numbers or letters six-inch (6")

high by three-quarters inch (3/4") stroke placed on a contrasting background on the front and rear doors of each suite/unit."

D. Chapter 7A of the California Building Code (CBC) and Section R337 of the California Residential Code (CRC) is adopted in its entirety with the amendments to read as follows:

Sections 706A.1 and 706A.3 of the CBC and Sections R337.6.1 and R337.6.3 of the CRC are hereby amended to read as follows:

706A.1 (CBC), R337.6.1 (CRC) General. New Buildings, additions, exterior remodels and reroofing of structures provided with or having existing ventilation openings for enclosed attics, enclosed eave soffit spaces, enclosed rafter spaces formed where ceilings are applied directly to the underside of roof rafters, and under-floor ventilation shall be in accordance with or shall be brought into accordance with Section 1203 (CBC) and Sections 706A.1 through 706A.3 (CBC) and Sections R337.6.1 through R337.6.3 (CRC) to resist building ignition from the intrusion of burning embers and flame through the ventilation openings.

706A.3 (CBC), R337.6.3 (CRC) Ventilation openings on the Underside of Eaves and Cornices: Vents may be installed on the underside of eaves and cornices provided that the eave and cornice vents are listed and approved as being resistant to the intrusion of flame and burning embers.

Exceptions:

3. Vents complying with the requirements of Section 706A.2 (CBC), R337.6.2 (CRC) may be installed on the underside of eaves and cornices in accordance with either one of the following conditions:

3.1 The attic space being ventilated is fully protected by an automatic sprinkler system installed in accordance with section 903.3.1.1(CBC).

3.2 The exterior wall covering and exposed underside of the eave are of noncombustible material, or ignition-resistant material as determined in accordance with SFM Standard12-7A-5 Ignition-Resistant Material and the vent is located more than 12feet from the ground or walking surface of a deck, porch, patio or similar surface.

SECTION 709A (CBC), R337.9 (CRC). Title is hereby amended to read as follows:

SECTION 709A (CBC), R337.9 (CRC) DECKS AND DECKING

Sections 709A.2 through 709A.4 (CBC), and Sections R337.9.2 through R337.9.4 (CRC) are hereby amended to read as follows:

709A.2 (CBC), R337.9.2 (CRC) Where required. The material of decks, porches, balconies and stairs shall comply with the requirements of this section.

709A.3(CBC), R337.9.3(CRC) Decks. The material of decks, porches, balconies and stairs shall be constructed with one of the following materials:

1. Ignition-resistant material that complies with the performance requirements of both SFM Standard 12-7A-4 and SFM Standard12-7A-5.

2. Exterior fire-retardant treated wood.

3. Noncombustible material.

4. Any material that complies with the performance requirements of SFM Standard 127A-4A when attached exterior wall covering is also either noncombustible or ignition-resistant material.

5. Heavy Timber construction consisting of the following:

5.1. Posts shall be a minimum of 6”X6” nominal dimension; 5.2. Beams shall be a minimum 6”X8” nominal dimension;

5.3. Joists shall be a minimum 4”X8” nominal dimension spaced at no greater than 24 inches on center;

5.4. Composite decking shall be listed by W.U.I. Products published by Cal-Fire;

5.5. Natural wood decking products shall be:

5.5.1. 2”X nominal lumber; or;

5.5.2. 5/4” Hardwood (i.e. teak, mahogany or other approved hardwood).

709A.4 (CBC), R337.9.4 (CRC) Clearance. Decks with less than 48 inches of clearance from finished grade to deck joists shall be enclosed with screen material with openings no greater $^1/_4$” maximum to prevent accumulation of trash, pine needles, etc.

E. Chapter 9, Section 903.2 of the California Building Code and the California Fire Code is hereby amended to read as follows:

903.2 Where Required. Approved automatic sprinkler systems in new buildings and structures, including pre-manufactured structures, shall be provided in the locations described in Sections 903.2.1 through 903.2.12.

F. Chapter 9, Section 903.2.11.7 is hereby added to the California Building Code and the California Fire Code to read as follows:

903.2.11.7 Building Fire Area 5,000Square Feet or More in Size. An approved automatic fire sprinkler system shall be provided throughout in all newly constructed buildings and structures of any occupancy group when the gross fire area, as defined in the California Building Code, is equal to or exceeds 5,000 square feet. EXCEPTIONS: Detached Group U occupancies accessory to a one- or two-family dwelling that are not used for commercial or industrial purposes.

G. Chapter 9, Section 903.2.11.8 is hereby added to the California Building Code and the California Fire Code to read as follows:

903.2.11.8 Additions to Existing Buildings. When an addition to an existing structure results in a structure having a fire area of more than 5,000 square feet and such addition is 50% or more of the original square footage, the entire structure shall be provided with an automatic sprinkler system.

H. Chapter 9, Section 903.7 is hereby added to the California Building Code and the California Fire Code to read as follows:

903.7 Freeze Protection. All sprinkler systems shall be suitably freeze-protected for climatic conditions as prescribed by the fire code official.

I. Section R313.2, Exception of the Residential Code is hereby amended to read as follows:

Exception: An automatic residential fire sprinkler system shall not be required for additions or alterations to existing buildings that are not already provided with an automatic residential sprinkler system where the addition or alteration is less than 50% of the original square footage or does not result in the creation of a fire area of more than 5,000 square feet.

J. Section R313.3.5.2 of the California Residential Code is hereby amended to read as follows:

R313.3.5.2 Required Capacity. The water supply shall have the capacity to provide the required design flow rate for sprinklers for a period of time as follows:

1. The water supply shall have the capacity to provide the required design flow rate for sprinklers for a minimum of 10 minutes regardless of the square footage or number of stories.

2. Where a well system, a water supply tank system, a pump, or a combination thereof is used, the water supply shall serve both domestic and fire sprinkler systems. Any combination of well capacity and tank storage shall be permitted to meet the capacity requirement.

Exception: Where a residential fire sprinkler system is supplied by a stored water source with an automatically operated means of pressurizing the system other than an electric pump, the water supply may serve the sprinkler system only.

K. Section 1511.3 of the California Building Code is amended by adding Section 1511.3.2 and Section R908.3 of the California Residential Code is amended by adding Section R908.3.2 to read as follows:

"Re-roofing over existing wood shingle or wood shake roofing is not permitted".

Section 4. Section 15.32 of the City of Big Bear lake Municipal Code is hereby amended to read in its entirety as follows:

Chapter 15.32 – GENERAL PROVISIONS FOR CALIFORNIA CODE OF REGULATIONS **15.32.010 -**

General provisions.

The requirements of this chapter are general in nature and apply to all the provisions in this Division I. (Ord.

82-72 § 1(part), 1982)

15.32.020 - Substitutions of references.

Whenever in any of the codes adopted in this division there appears a reference to the following names or terms, those names or terms shall be deemed and construed as follows:

A. "City of" or any other similar reference to a political entity means the city of Big Bear Lake, California.

B. "City Council" means the City Council of the City of Big Bear Lake, California.

C. "Building Official," "electrical safety engineer," "administrative authority" or any other similar term which makes reference to the individual official, board, department, or agency created by law to administer and enforce the provisions of the codes adopted in this division means the "director of building and safety and his authorized assistants."

D. “Codes” means the California Code of Regulations as adopted by the City of Big Bear Lake per Section 15.04.010.

(Ord. 82-72 § 1(part), 1982)

15.32.030 - Permit fees.

Any and all references to fees in any of the codes adopted in this division are deleted and referenced to fees which shall be established by the City Council by resolution or ordinance from time to time.

(Ord. 92-219 § 2, 1992: Ord. 82-72 § 1(part), 1982)

15.32.040 - Annual permits.

A. Where any person, firm or corporation in the course of normal maintenance procedures proposes to install, alter or repair any electrical wiring, devices, appliances, plumbing, drainage systems, septic tanks, seepage pits, leaching lines, heating, ventilating, refrigeration or water conservation equipment in an existing facility located on property under the direct control of such person, firm or corporation and is able to, and does in fact, furnish inspection service which meets the requirements and rules and regulations of this code, and whose operations are under the continuous supervision of a professional engineer or engineers, duly registered with and licensed by the state of California, such person, firm or corporation shall not be required to obtain approval at each consecutive inspection step of the installation, alteration or repair but shall be required only to obtain an annual permit or annual permits and assure that the work in progress is accessible to the director of building and safety for such periodic inspections as he may deem necessary.

B. The designated responsible supervising engineer shall file with the Building and Safety Department a written report specifying the work done under the issued annual permit. Such written report shall be filed with the department of building and safety within thirty days following the end of the fiscal year for which the permit was issued.

(Ord. 92-219 § 3, 1992; Ord. 82-72 § 1(part), 1982)

15.32.050 - Interpretation of code.

It shall be the duty of the building official to enforce the provisions of the codes and to determine the intent and meaning thereof. Any determination or decision, made by the building official which is in dispute is subject to review and final decision by the board of appeals as established by Section 1.8.8 and Appendix B of the California Building Code as adopted in this code per Section 15.04.010. The board of appeals shall have no authority relative to interpretation of

the administrative provisions of the codes nor shall the board be empowered to waive requirements of the codes. (Ord. 95-264 § 1(part), 1995: Ord. 92-219 § 4, 1992: Ord. 82-72 § 1(part), 1982) **15.32.060 - Preliminary soil report—Approval of final subdivision map.**

A. Subdivision maps shall not be given a final approval until a preliminary soil report, prepared by a civil engineer, registered by the state of California, has been filed with and approved by the director of building and safety.

B. The preliminary soil report shall indicate the presence, if any, of expansive soils or Any other soil problem which, if not corrected, would lead to structural defects. If defective soil conditions are indicated, the preliminary report shall include recommendations for corrective measures intended to prevent structural damage to buildings erected on the site. Acceptance and approval of these recommendations shall not preclude the consideration and approval of alternate methods of correction which may be submitted by any other California registered civil engineer when accompanying a permit application for construction of a specific building or buildings.

C. The preliminary soil report shall be based upon test borings or excavations. The number of borings or excavations shall be adequate to determine fully the extent and degree of soil problems, if any, which exist in the proposed subdivision; provided, however, that not less than three such borings or excavations shall be required for each report. If critically defective soil conditions are disclosed by initial borings or excavations, additional borings or excavations shall be made at the probable building location on each lot or parcel within the subdivision. Appropriate notations shall be made upon the subdivision map so as to indicate the location and type of defective soil noted in the preliminary report.

D. The Chief Building Official shall approve the preliminary soil report:

    1. If no defective soils are present on the site; or

    2. If the corrective measures recommended in the report would be likely to prevent structural damage to any buildings constructed on the site.

E. The preliminary soil report may be waived when the sole purpose of the subdivision map is to assemble small lots or parcels into larger lots or parcels or to define, adjust or correct property lines of existing subdivisions.

F. The issuance of a building permit for the construction of a building on a lotor parcel of land which has been found to have defective soils shall be conditioned to the incorporation of an approved corrective measure intended to prevent structural damage to the building.

(Ord. 82-72 § 1(part), 1982)

15.32.070 - Water conservation.

Water used as a coolant in any stationary equipment or machinery, or water utilized for heating or cooling in an industrial process, shall not be wasted but shall be recirculated and reused. Every evaporative cooler shall be equipped with a circulating pump.

(Ord. 82-72 § 1(part), 1982)

15.32.080 - Penalty for violation.

It is unlawful for any person to erect, construct, enlarge, alter, repair, move, use, occupy or maintain any building, structure, equipment, or portion thereof in the city or cause the same to be done contrary to or in violation of any provision of this title or any provisions of the codes, rules or regulations adopted in this title. No person shall violate any of the provisions, or fail to comply with any of the requirements of this title. Where work for which a permit is required by the codes adopted in this division is started or proceeded with prior to obtaining the permit, the specified fees shall be doubled, but the payment of such penalty fee shall not relieve any persons from fully complying with the requirements of these codes in the execution of the work nor from any other penalties prescribed herein; provided, however, that this provision shall not apply to emergency work when it shall be proved to the satisfaction of the director of building and safety that such work was urgently necessary and that it was not practical to obtain a permit therefor before commencement of the work. In all such cases a permit must be obtained as soon as it is practical to do so, and if there is an unreasonable delay in obtaining such permit, a double fee as herein provided shall be charged. Any section in any of the codes adopted in this division which is in conflict to this section is hereby repealed.

(Ord. 92-219 § 5, 1992: Ord. 82-72 § 1(part), 1982)

15.32.090 - Interpretation, legal procedure and penalties.

A. Interpretation. In interpreting and applying the provisions of this division, the provisions shall be held to be the minimum requirements for the promotion of public health, safety, and general welfare.

B. Penalties. Any building or structure erected or maintained, or any use of property contrary to the provisions of this division shall be and the same is declared to be unlawful and a public nuisance and the city attorney shall, upon order of the director of building and safety, immediately commence an action or actions, proceeding or proceedings, for the abatement, removal and enjoinment thereof in the manner provided by law and shall take such steps and shall apply to such court or courts as may have jurisdiction to grant such relief as will abate or remove such building, structure, or use, and restrain and enjoin any person from erecting or maintaining such building or structure or using any property contrary to the provisions of this division. It shall be the right and duty of every citizen to participate and assist the city officials in the enforcement of the provisions of this division.

    1. All remedies provided for herein shall be cumulative and not exclusive. The conviction and punishment of any person hereunder shall not relieve such person

from the responsibility of correcting prohibited conditions or removing prohibited buildings, structures or improvements, nor prevent the enforced correction or removal thereof.

2. Any person, firm or corporation, whether as principal, agent, employee, or otherwise, violating or causing or permitting the violation of any of the provisions of this division, or of any permit or exception granted hereunder, shall be guilty of a misdemeanor and upon conviction thereof, shall be punishable for each such offense by a fine of not more than one thousand dollars or by imprisonment in the city jail for a term not to exceed six months, or both such fine and imprisonment. No suspension of sentence or probation shall be granted to any such violator unless there is included in the terms thereof that the violator shall comply with the provisions which he has been convicted of violating and shall abate or correct the illegal condition, alteration, enlargement, conversion, movement or maintenance of any building established, constructed, operated or maintained contrary to the provisions of this code.

3. Each such person, firm or corporation shall be deemed guilty of a separate offense upon each day during any part of which any violation of any of the provisions of this division is committed, continued, permitted or maintained by such person, firm or corporation and shall be punishable therefor as herein provided.

4. A notice of pendency of administrative action or proceeding may be filed in the recorder's office at the time of commencement of action or proceeding or at any time before final judgment or order. The recorder shall record and index the pendency of action in the name of each person specified in the action or proceeding. After all required work has been completed and approved, the director of building and safety shall record in the office of the recorder a document terminating the above notice.

5. In the event that any person, firm or corporation shall fail, neglect or refuse to demolish, remove, abate or correct a structure or condition existing in violation of this division, upon his or its property after a civil court order or criminal conviction obtained pursuant to this section the city council may order the director of building and safety to demolish, remove, abate or correct the offending structure or condition. A statement of the cost of such work shall be transmitted to the city council who shall cause the same to be paid and levied as a special assessment against the property.

(Ord. 82-72 § 1(part), 1982)

15.32.100 - Findings.

The City Council finds that these regulations and provisions and those of the codes adopted in this division are in compliance with Section 17922 of the Health and Safety Code of the state of California and that the modifications and changes herein made to the model codes herein adopted are necessary due to local conditions.

(Ord. 82-72 § 1(part), 1982)

15.32.110 - Validity.

If any chapter, section, subsection, sentence, clause or phrase of this division is, for any reason, held to be unconstitutional, such decision shall not affect the validity of the remaining portions of this division nor its application to other persons or circumstances. The City Council declares that it would have passed this division and each chapter, section, subsection, clause, sentence or phrase thereof, irrespective of the fact that any one or more section, subsection, clause, sentence and phrase be declared unconstitutional.

(Ord. 82-72 § 1(part), 1982)

Section 5. Chapter 15.33 of Division 15 of The City of Big Bear Lake Municipal Code is amended in its entirety to read as follows:

15.33.010: International Property Maintenance Code, 2018 Edition.

The 2018 International Property Maintenance Code (IPMC), including appendix A, is adopted in its entirety, subject to the amendments, additions, and deletions set forth in this chapter. The IPMC will apply to all occupancies identified by the California Building Code. One copy of the IPMC is on file in the office of the City Clerk and Building Department, which is available for public viewing as required by law.

15.33.020: Amendments.

The following amendments to the 2018 International Property Maintenance Code are adopted to read as follows:

A. All references to “International” codes shall be replaced with “California” codes.

B. Section 101.1 is hereby replaced in its entirety with the following:

Section 101.1 Title. These regulations shall be known as The City of Big Bear Lake International Property Maintenance Code.

C. Section 102.3 is hereby replaced in its entirety with the following:

Section 102.3 Application of other codes. Repairs, additions or alterations to a structure, or changes of occupancy, shall be done in accordance with the procedures and provisions of the California Code of Regulations as amended and adopted by The City of Big Bear Lake or Title 25 inclusive of the State Housing Law.

D. Section 102.7.1 is hereby replaced in its entirety with the following:

Section 102.7.1 Conflicts. Where conflicts occur between provisions of this code, and the California Code of Regulations as amended and adopted by The City of Big Bear Lake, The City of Big Bear Lake Municipal Code, or Title 25, the most restrictive shall govern.

E. Section 103.5 is hereby replaced in its entirety with the following:

Section 103.5 Fees. The fees for activities and services performed by the department in carrying out its responsibilities under the IPMC shall be per the most recent adopted fee schedule adopted by the City of Big Bear Lake City Council.

F. Section 104.3 is hereby amended as follows:

Section 104.3 Right of Entry. Where it is necessary to make an inspection to enforce the provisions of this code, or whenever the code official has reasonable cause to believe that there exists in a structure or upon a premises a condition in violation of this code, the code official is authorized to enter the structure or premises at reasonable times to inspect or perform the duties imposed by this code, provided that if such structure or premises is occupied the code official shall present credentials to the occupant and request entry. If such structure or premises is unoccupied, the code official shall first make a reasonable effort to locate the owner, owner's authorized agent or other person having charge or control of the structure or premises and request entry. If entry is refused, the code official shall have recourse to the remedies provided by law to secure entry. Any and all costs incurred by the city in connection with securing lawful entry to a structure or premise including but not limited to, costs of investigation, staffing costs incurred in the preparation of warrants, and all subsequent costs necessary to enforce compliance with the provisions of this Code may be recovered including late payment charges and costs of collection by use of any and all available legal means.

Justification:
1. To clarify the process of cost recovery where the Right of Entry for inspection of a premise or structure is refused.

G. Section 107.4 is hereby replaced in its entirety as follows:

Section 107.4 Unauthorized tampering. Placards, notices, signs, tags or seals posted or affixed by the code official shall not be mutilated, destroyed, tampered with, or removed without authorization from the code official. Any person violating this subsection shall be guilty of a misdemeanor.

Justification
1. To include the terms " Notices" and " Placards" referenced in 2018 IMPC 108.3 & 108.4 and comply with 1997 Uniform Housing Code Sec. 1104.2 and 1997 Abatement of Dangerous Buildings Section 404.1.

H. Section 107.7 is hereby added as follows:

Section 107.7 Recordation of Notices and Orders. If compliance with the order is not achieved within the time specified therein, and no appeal has been properly and timely filed, the code official is authorized to file in the office of the county recorder a certificate describing the property and certifying (i) that the premise, building, structure or building service equipment is in violation of this code or the technical codes and (ii) that the owner has been so notified. Whenever the ordered corrections have been completed and the violations no longer exist on the property described in the certificate, the code official shall issue a new certificate certifying that all required corrections have been made.

***Justification**:*

1. To comply with the recordation guidelines in the 1997 Abatement of Dangerous Buildings code Section 402.

I. Section 108.1 is hereby amended as follows:

Section 108.1 General. When a structure or equipment is found by the code official to be unsafe, or when a structure is found unfit for human occupancy, or is found unlawful, such structure shall be posted in accordance with this section and declared to be a public nuisance and the violations shall be abated by repair, rehabilitation, demolition or removal pursuant to the provisions of this code.

Justification:

The section focused on condemnation only, revised it to more closely follow the language from Section 202 of the Dangerous Building Code.

J. Section 108.1.4 is hereby amended as follows:

Section 108.1.4 Unlawful structure. An unlawful structure is; one found in whole or in part to be occupied by more persons than permitted under this code, or was erected, altered, occupied or maintained contrary to law; or one that is partially constructed, reconstructed or demolished upon which work is abandoned. Work is deemed abandoned when there is no valid building or demolition permit.

Justification:

1. To include a portion of 1997 Dangerous Building Code Section 302 (18)

K. Section 108.2 is hereby amended as follows:

Section 108.2 Unsafe Equipment. If the structure is vacant and unfit for human habitation and occupancy, and is not in danger of structural collapse, the code official is authorized to post a placard on the premises and order the structure closed up so as not to be an attractive nuisance. Upon failure of the owner or owner's authorized agent to close up the premises within the time specified in the order, the code official shall cause the premises to be closed and secured through any available public agency or by contract or arrangement by private persons and the cost there of shall be charged against the real estate upon which the structure is located and shall be a lien upon such real estate and shall be collected by any other legal resource.

***Justification**:*

1. *The section referenced posting the structure for condemnation only however we post several different types of placards.*

K. Section 108.3 is hereby amended as follows:

Section 108.3 Notice. Whenever the code official posts a structure, equipment or premise under the provisions of this section, the posting shall be in a conspicuous place in or about the affected structure, equipment or premise and a notice in the form specified in Section 107.2 shall be served on the owner, owner's authorized agent or the person or persons responsible for the structure, equipment or premise. If the posting pertains to equipment, it

shall also be placed on the equipment. The notice shall be in the form prescribed in Section 107.2.

Justification:

1.The section focused on posting structures or equipment for condemnation only however we use several different types of posting.

M. Section 108.4 is hereby replaced in its entirety with the following:

Section 108.4 Posting and placarding. 108.4 Placarding. When the code official determines a structure, equipment or premise has been erected, constructed, enlarged, altered, repaired, moved, improved, removed, damaged, converted or demolished, equipped, used, occupied or maintained in violation of this code and the structure, equipment or premise constitutes a danger to the life, limb, property or safety of the public or the occupants, the code official shall post a placard on the structure, equipment or premise in a conspicuous place in or about the affected structure, equipment or premise. The placard shall clearly state the code official's Order regarding the structure, equipment or premise, and specify the conditions which necessitated the posting.

Justification*:*

1.The section focused on posting structures or equipment for condemnation only however we use several different types of posting.

N. Section 108.5 is amended as follows:

Section 108.5 Prohibited Occupancy. It shall be unlawful for any person, owner, owner's authorized agent or person responsible for the premise to occupy or allow to be occupied a placarded structure or premise or operate placarded equipment in violation of the code official's posted order.

Justification:

1.The section focused on posting structures or equipment for condemnation only however we use several different types of posting.

O. Section 108.7 is amended as follows:

Section 108.7 Recordation of notice and order. If the dangerous, damaged or substandard building is not repaired or demolished by the owner within the prescribed time(s), and no appeal has been properly and timely filed, the code official shall file in the office of the county recorder a certificate describing the property and certifying (i) that the building is a substandard building and (ii) that the owner has been so notified, if such recordation has not already been made during the course of the proceedings.

Whenever the corrections ordered shall thereafter have been completed or the building demolished so that it no longer exists as a substandard building described in the certificate, the code official shall file a new certificate with the county recorder certifying that the building has been demolished or all required corrections have been made so that the building is no longer substandard, whichever is appropriate.

P. Section 111.1 is appended to add the following sentence:

Section 111.1 Application for appeal. Any person directly affected by a decision of the code official or a notice or order issued under this code shall have the right to appeal to the board of appeals, provided that a written application for appeal is filed within 20 days after the day the decision, notice or order was served. An application for appeal shall be based on a claim that the true intent of this code or the rules legally adopted thereunder have been incorrectly interpreted, the provisions of this code do not fully apply, or the requirements of this code are adequately satisfied by other means. In order for the application for appeal to be valid, payment of the appeal

hearing fee must be received at the time of the application for appeal is submitted to the city.

Q. Section 112.4 is hereby replaced in its entirety with the following:

Section 112.4 Failure to comply. Any person who shall continue any work after having been served with a stop work order is in violation of this code shall receive a penalty per IMPC Section 106.4.

R. Section 202 is amended as follows:

Section 202 Garbage. Garbage shall be defined pursuant to Big Bear Lake Municipal Code Section 8.64.010.

Justification:

1. Big Bear Lake Municipal Code Section 8.64.010 has already defined this term.

S. Section 202 is amended as follows:

Section 202 Rubbish. Rubbish shall be defined pursuant to Big Bear Lake Municipal Code Section 8.64.010.

Justification:

2. Big Bear Lake Municipal Code Section 8.64.010 has already defined this term.

T. Section 302.1 is amended as follows:

Section 302.1 Sanitation. The property exterior and premises shall be maintained by the property owner in a clean, safe, and sanitary condition. In residential zones, accumulations of building materials, junk, rubbish, garbage, debris, scrap materials, boxes or similar storage containers, household items or residential belonging or similar objects, except items designed for exterior use such as lawn furniture, shall not be stored or maintained in the front yard area or unenclosed patios, porches or areas visible from any street or public way or accessible to the public for a period of time in excess of seventy–two consecutive hours. Property owners shall remain liable for violations thereof regardless of any contract or agreement with any third party regarding such property. The owner of any building lot or premises within the City where a business, trade or profession has established a fixed place of business pursuant to Big Bear Lake Municipal Code section 8.04, shall also comply with the requirements of Title 8 of the Municipal Code.

Justification:

1. The property owner is always held responsible for the proper maintenance of their property. This also sets a standard and time-frame that exterior storage is allowed in residential zones and refers user to Title 8 for specific requirements for commercial uses/properties.

U. Section 302.2 is hereby appended with the following:

Section 302.2 Grading and drainage. Premises shall be graded and maintained to prevent the erosion of soil and to prevent the accumulation of stagnant water thereon, or within any structure located thereon. Excess or concentrated drainage shall be contained onsite or directed to the nearest practicable drainage facility approved by the code official.

Justification:

1. To comply with 2019 California Building Code Section J109.4

V. Section 302.4 is amended as follows:

Section 302.4 Weeds. The term [JURISDICTION TO INSERT HEIGHT IN INCHES] shall be replaced by "4 inches" in accordance with The City of Big Bear Lake Municipal Code Sections 17.10.070 and 17.25.100."

W. Section 302.8 is hereby appended as follows:

Section 302.8 Motor Vehicles. **Add sentence to paragraph**: "Refer to Municipal Code Chapter 8.82 for vehicle abatement and removal regulations."

X. Section 303.2 is hereby amended with the following:

Section 303.2. Enclosures. Except as provided for in other regulations, private swimming pools, hot tubs, spas and ponds, containing water more than 18 inches (457 mm) in depth shall be completely surrounded by a fence or barrier 60 inches (1219mm) in height above the finished ground level measured on the side of the barrier away from the pool. Gates and doors in such barriers shall be self-closing and self-latching. Where the self-latching device is less than 54 inches (1372 mm) above the bottom of the gate, the release mechanism shall be located on the pool side of the gate. Self-closing and self-latching gates shall be maintained such that the gate will positively close and latch when released from an open position of 6 inches (152 mm) from the gatepost. No existing pool enclosure shall be removed, replaced, changed or maintained in a manner that reduces its effectiveness as a safety barrier.

Exception: Pool fences or barriers that do not meet the above minimum requirements can remain as long as the fence or barrier complied with the building code provisions at time of building permit and passed the final inspection from the city.

Justification:
1.To comply with the guidelines of the 2019 California Building Code Section 3119 Band the Swimming Pool Safety Act of the California Health & Safety Code Section 115920.

Y. Section 304.14 is hereby amended with the following:

Section 304.14 Insect screens. Every door, window and other outside opening required for ventilation of habitable rooms, food preparation areas, food service areas or any areas where products to be included or utilized in food for human consumption are processed, manufactured, packaged, or stored shall be supplied with approved tightly fitting screens of minimum 16 mesh per inch (16 mesh per 25 mm), and every screen door used for insect control shall have a self-closing device in good working condition.

Z. Section 304.15 is hereby amended with the following:

Section 304.15 Doors. All exterior doors, door assemblies including weather stripping, thresholds, and hardware shall be maintained in good condition.

Justification
1. To comply with California Health and Safety Code Section 17920. 3.

AA. Section 304.16 is hereby amended with the following:

304.16 Under-Floor areas. Under-floor access doors and ventilation openings shall be maintained to prevent the entrance of rodents, rain and surface drainage water. Doors shall be tight fitting and ventilation openings shall be properly screened with corrosion-resistant wire mesh having openings not exceeding 1/4 inch and minimum of 1/8 inch in any dimension or alternate approved materials pursuant to 2019 CBC1202.4.1.

Justification:
1. To comply with California Health and Safety Code Section 17920. 3.

BB. Section 304.18.2 is hereby amended with the following:

304.18.2 Windows. Operable windows that provides access to a dwelling unit, rooming unit or housekeeping unit that is rented, leased or let shall be equipped with a window sash locking device when they are located in whole or in part within 12 feet above ground level or walking surface or 6 feet horizontally from the ground, a roof, or any other platform.

Justification
1. *To comply with California Civil Code Section 1941. 3(a) 2.*

CC. Section 305.1 is hereby amended with the following:

305.1 General. The interior of a structure and equipment therein including but not
Limited to cabinets, counters and hardware shall be maintained in good repair, structurally sound and in a sanitary condition**.** Occupants shall keep that part of the structure that they occupy or control in a clean and sanitary condition. Every owner of a structure containing a rooming house, housekeeping units, a hotel, a dormitory, two or more dwelling units or two or more nonresidential occupancies, shall maintain, in a clean and sanitary condition, the shared or public areas of the structure and exterior property

Justification:
1. To comply with California Health and Safety Code Section 17920.3(a) 14

DD. Section 305.6 is hereby amended with the following:

305. 6 Interior Doors. Every interior door and hardware shall be properly installed and maintained in a workmanlike manner and capable of being opened, closed and latched.

Every interior door shall fit reasonably well within its frame and shall be securely attached to the jambs, headers or tracks as intended by the manufacturer of the attachment hardware.

Justification:
1. To comply with California Health and Safety Code Section 17920.3(a) 14

EE. Section 307.1 is hereby replaced in its entirety with the following:

Section 307.1 General. Handrails and guards shall be constructed and maintained in accordance with the California Code they were permitted under.

FF. Section 309.1 is hereby amended with the following:

309.1 Infestation. All structures shall be kept free from insect, rodent and vermin infestation. When an insect, rodent or vermin infestation is brought to the attention of the code official, he or she may require the owner or owner's authorized agent having charge or control of the building, lot or premise to hire a licensed exterminator or other qualified professional to inspect the building, lot or premise and provide a written report verifying the presence and severity of such infestation including in the report a recommendation for proper extermination of the infestation. All structures in which insect, rodent or vermin infestations are found, shall be promptly exterminated by approved processes that will not be injurious to human health. After the extermination of the infestation is complete, the code official may request a written notice from the licensed exterminator or other qualified professional attesting to the completion and success of the recommended extermination procedures. After the infestation is eliminated, proper precautions shall be taken to prevent reinfestation.

Justification:
1. California Health and Safety Code Sec 17920.3(12) states "Infestation of insects, vermin, or rodents as

determined by the health officer. "renders dwelling units substandard. The language has been amended to clarify the process.

GG. Section 602.3 is hereby amended with the following:

309.2 Owner. The owner of any structure shall be responsible for extermination within the structure prior to renting or leasing the structure. The owner of a structure or premise containing a dwelling unit, multiple occupancy, rooming house or a nonresidential structure shall be responsible for maintaining the structure and premise in a rodent and/ or pest -free condition. If an infestation is caused by an occupant substantially failing to properly maintain their occupied area of the structure or premise as clean and sanitary as the condition of the structure or premise permits". For as long as the occupants failure either substantially causes an unlivable condition to occur, or substantially interferes with the owners ability to repair the condition, the owner does not have to repair the condition. Where the infestation is caused by defects in the structure, the owner shall be responsible for extermination.

Justification:
1. To agree with California Civil Code Section 1941. 2(a)

HH. Delete Sections 309.3 Single Occupant through Section 309.5 Occupant in their entirety:

Justification:
1. To comply with the California Tenants Handbook guidelines.

II. Section 404.4.1 is hereby amended with the following:

Section 404.4.1 Room Area. Every habitable room except kitchens shall contain not less than 70 square feet (6. 5 m2) and every bedroom shall contain not less than 70 square feet (6. 5 m2) and every bedroom occupied by more than one person shall contain not less than 50 square feet (4.6 m2) of floor area for each occupant thereof.

Justification:
1. This section revised to comply with 2019 California Residential Code requirements of SectionR304.

JJ. Section 505.4 is hereby amended with the following:

Section 505.4 Water heating facilities. Water heating facilities shall be properly installed, maintained and capable of providing an adequate amount of water to be drawn at every required sink, lavatory, bathtub, shower and laundry facility at a temperature not less than 110°F (43°C). A gas-burning water heater shall not be located in any bathroom, toilet room, bedroom or other occupied room normally kept closed unless the installation complies with Chapter 5 of the 2019 California Plumbing Code and Section 904.0 of the 2016 California Mechanical Code. An approved combination temperature and pressure-relief valve and relief valve discharge pipe shall be properly installed and maintained on water heaters.

Justification:
To comply with 2019 California Residential code guidelines for temperature measurements and reference the requirements of the CPC and CMC.

JJ. Section 602.2 is hereby amended with the following:

Section 602.2 Residential Occupancies. Dwellings shall be provided with heating facilities capable of maintaining a room temperature of 68°F (20°C) in all habitable rooms, bathrooms and toilet rooms as measured per IPMC Section 602.5. Cooking appliances or fireplaces shall not be used, nor shall portable space heaters

be used, as a means to provide required heating.

KK. Section 602.3 is hereby amended with the following:

Section 602.3 Heat Supply. Every owner and operator of any building who rents, leases or lets one or more dwelling units or sleeping units on terms, either expressed or implied, to furnish heat to the occupants thereof shall supply heat to maintain a minimum temperature of 68°F (20°C) in all habitable rooms, bathrooms and toilet rooms

LL. Section 602.4 is hereby amended with the following:

Section 602.4 Occupiable work spaces. Indoor occupiable work spaces shall be supplied with heat to maintain a minimum temperature of 65°F (18°C) during the period the spaces are occupied.

Exceptions:

1. Processing, storage and operation areas that require cooling or special temperature conditions.
2. Areas in which persons are primarily engaged in vigorous physical activities.

MM. Section 702.1, is hereby amended with the following:

Section 702.1 General: A safe, continuous and unobstructed path of travel shall be provided from any point in a building or structure to the public way. Means of egress shall comply with the California Building Code.

NN. Section 704.6.1, Exception 4 is added as follows:

Section 704.6.1, Exception 4: Structures that are a part of the TPHR program (Temporary Housing Rentals) shall comply with the current adopted codes per City of Big Bear Lake Municipal Code Section 15.04.010.

Section 6. Section 15.34.020 of the City of Big Bear Lake Municipal Code is hereby amended in its entirety to read in as follows:

15.34 – ROOF SNOW LOAD REQUIREMENTS

15.34.010 Applicability of Provisions

The provisions of this chapter are minimal requirements and apply to all construction, erection, enlargement, alteration, repair, moving, conversions, change of occupancy (use) and maintenance of building(s) and/or structure(s) within the city.

(Ord. 92-219 §6(part), 1992)

15.34.020 Design Requirements.

A. Section 1608 of the California Building Code is amended to by adding Section 1608.1.1 to read as follows:

"The following roof design requirements for snow load shall apply within the City of Big Bear Lake: Buildings and other structures and all portions thereof that are subject to snow loading shall be designed to resist a roof snow load of one-hundred (100) pounds per square foot snow load."

B. Section 1608 of the California Building Code is amended by adding Section 1608.2.1 to read as follows:

"The following roof design requirements for snow loads shall apply within the City of Big Bear Lake: The ground snow load design per square foot shall not be less than eight-five (85) pounds as used for drift snow load"

C. Table R301.2 (1) Climatic and Geographic Design Criteria of the California Residential Code by adding the following design criteria values as listed below in items 1 through 12 to read as follows:

1. Ground Snow Load: 85 psf; Roof Snow Load:100 psf;
2. Wind Design Speed: 85mph;
3. Wind Design Topographic Effects: No;
4. Seismic Design Category: E;
5. Subject to Weathering From Weathering: Negligible;
6. Subject to Weathering From Frost Line Depth: 18inches;
7. Subject to Weathering From Termites: Yes;
8. Winter Design Temperature (Zone):16;
9. Ice Barrier Underlayment Required: Yes;
10. Flood Hazards: FIRMs Numbers 06071C8005 H, 06071C8007 H, 06071C8010 H, 06071C7290 H, 06071C7295 H and 06071C8026 H;
11. Air Freezing Index:500;
12. Mean Annual Temperature: 48 degrees Fahrenheit.

Section 6. Section 15.36 of the City of Big Bear lake Municipal Code is hereby amended to read in its entirety as follows:

Chapter 15.36 – FIRE RETARDANT ROOF COVERINGS

15.36.010 - Applicability of provisions.

The provisions of this chapter are minimal requirements, and apply to all construction, erection, enlargement, alteration, repair, moving, conversions, change of occupancy (use) and maintenance of building(s) or structure(s) within the City of Big Bear Lake. All such buildings or structures shall be made to comply with this chapter: (i) when such building or structure is increased by twenty-five (25) percent or more of the building or structure's square footage; (ii) prior to, and as a condition precedent to, final approval by the city building official, or his or her designee, of the remodeling of the building or structure where the replacement of the wood shake shingle roof would cost less than fifty (50) percent of the total calculated value of the remodel; or (iii) prior to, and as a condition precedent to, the issuance, reissuance or renewal of any private home rental license, or the reinspection of a building or structure for the purposes of the reissuance or renewal of such a license. When the provisions of the California Building Code, which is adopted by the city, are in conflict with these provisions, the more restrictive in terms of fire resistance or fire retardance shall apply.

(Ord. 2008-383 § 5, 2008: Ord. 2007-373 § 1, 2007: Ord. 83-74 § 1(part), 1983) (Ord No. 2016-453, § 6, 10-24-16)

A. Section 1505 of the California Building Code is amended by adding Section 1505.1.5 and Section R902.1 of the California Residential Code is amended by adding Section R902.1.5 to read as follows:

"The entire roof covering of any building hereafter constructed, including re-roofing of existing buildings

exceeding ten percent (10%) or more of the existing roof, shall be Class "A" covering as defined in Chapter 15 of the California Building Code. The removal of more than twenty-five percent (25%) of the roof sheathing and or supporting structural components shall constitute a new roof thereby requiring the entire roof structure that is under repair to be in compliance with the California Building Code".

B. Louvers, ventilators or openings in walls, roofs, attics, and underfloor areas having headroom less than four feet in height which are not fitted with sash or doors, shall be covered with wire screen. The screen covering such openings shall be of galvanized metal or copper and shall have a maximum mesh of one- eighth inch. Such underfloor areas four feet or more in height shall comply with subsection C of this section. Eave-type attic ventilators are not permitted. The space between rafters at exterior walls shall be solidly filled with tight-fitting wood blocks one and one-half inches thick.

C. Unenclosed underfloor areas of stilt-type or cantilevered-type construction, when constructed of wood, shall have structural members with a least dimension of six inches nominal, or be protected with materials approved for one-hour fire-resistive construction on all exposed surfaces. Floor decking, when of wood, shall be one and one-half inch nominal thick tongue and groove plywood, or be protected with materials approved for one-hour fire-resistive construction on the underside.

D. Cantilevered or standard type decks shall be constructed with minimum one and one-half inch thick wood decking or be of incombustible or one-hour fire-resistive construction on the underside.

E. Every chimney used in conjunction with any fireplace, incinerator, or heat-producing appliance in which solid or liquid fuel is used, shall be maintained with a spark arrestor constructed with heavy wire mesh or other noncombustible materials with openings not to exceed one-half inch mounted in or over all outside openings, in a vertical or near vertical position visible from the ground.

F. The chief building official may waive the requirements of this section on those properties where it is determined by the chief of the fire department having jurisdiction that none of the following conditions exist:

    1. Insufficient water supply or pressure;
    2. Inadequate accessibility for fire suppression equipment;
    3. Located in or within four hundred feet of a hazardous fire area as determined by the chief of the fire department.

(Ord. 2008-376 § 5, 2008; Ord. 95-264 § 1(part), 1995; Ord. 92-219 § 7, 1992; Ord. 83-74 § 1(part), 1983)

(Ord. No. 2010-411, § 5, 11-22-2010; Ord. No. 2014-433, § 5, 7-14-2014; Ord No. 2016-453, § 6, 10-24-16)

Section 7. Section 15.39 of the City of Big Bear Lake Municipal Code is being repealed in its entirety due to stricter standards in the current adopted California Green Building Standards Code:

Section 8. Section 15.40 of the City of Big Bear Lake Municipal Code is hereby amended in its entirety to read as follows:

15.40 Amendments to California Fire Code.

I. Chapter 1, Section 101.1 of the California Fire Code is hereby amended to read as follows:

101.1 Title. These regulations and adopted standards and interpretations, as approved by the fire code official, shall be known as the "Fire Code of the Big Bear Fire Authority", hereinafter referred to as, "Big Bear Fire Authority Fire Code, or "this code."

II. Chapter 1, Section 103.2 of the California Fire Code is hereby deleted.

III. Chapter 1, Section 104.10 of the California Fire Code is hereby amended to read as follows:

104.10 Fire Investigations. The fire code official, the fire department or other responsible authority shall have the authority to investigate the cause, origin and circumstances of any fire, explosion or other hazardous condition. Department investigators designated by the Fire Chief, shall have the powers of a peace officer in performing their duties and are authorized to conduct investigative detentions, issue criminal citations and make arrests pursuant to California Penal Code Section 830.37 and this code. The fire code official shall pursue any investigation to its conclusion. Information that could be related to trade secrets or processes shall not be made part of the public record except as directed by a court of law.

IV. Chapter1, Section 104.12 is added to the California Fire Code and is to read as follows:

104.12 Cost Recovery. Fire suppression, investigation, plan review, administrative costs, and rescue or emergency medical costs are recoverable in accordance with Health
and Safety Code Sections 13009 and 13009.1 and by Department resolution.

V. Chapter1, Section 104.13 is added to the California Fire Code and is to read as follows:

104.13 Expenses for Securing an Emergency. Any person who negligently or intentionally, or in violation of law, causes an emergency response, including, but not limited to, a traffic accident or spill of toxic or flammable or combustible liquids or chemicals, is liable for the costs of securing such emergency, including those costs set out in Health and Safety Code Section 13009 et seq. and Government Code Section 53150 et seq. Any expense incurred by the fire department for securing such an emergency situation shall constitute a debt of such person and shall be collectible by the Authority in the same manner as in the case of an obligation under contract, express or implied.

VI. Chapter 1, Section 105.6.5 of the California Fire Code is hereby amended to read as follows:

105.6.5 Carnivals, Fairs, Block Parties, and Other Outdoor Assemblage. An operational permit is required to conduct a carnival, fair, block party, race, concert, parade or other similar outdoor assemblage whether, public or private, when in the opinion of the fire code official, a permit and specific conditions are required due to the nature or location of the activity.

VII. Chapter 1, Section 105.6.32 of the California Fire Code is hereby amended to read as follows:

105.6.32 Open burning. An operational permit is required for the kindling or maintaining of an open fire, bonfire, or recreational fire on any public street, alley, road, or other public or private ground. Instructions and stipulations of the permit shall be adhered to.

Delete: "EXCEPTION: Recreational fires."

VIII. Chapter 1, Section 105.6.31 of the California Fire Code is hereby amended to read as follows:

105.6.31 Open flames and torches. An operational permit is required to remove paint with a torch, or to use a torch or open flame device.

EXCEPTION: The use of decorative torches on the property of one- and two-family dwellings shall not be permitted.

IX. Chapter 1, Section 105.7.19 is hereby added to the California Fire Code to read as follows:

105.7.19 Pallet Yards. An operational permit is required to store, manufacture, refurbish or otherwise handle wood or plastic pallets in excess of 50 pallets.

X. Chapter1, Section 108 of the California Fire Code is hereby amended to read as follows:

108.1 Board of Appeals established. In order to determine the suitability of alternative materials and types of construction and to provide reasonable interpretations of the provisions of this code, a Committee of the Big Bear Fire Authority Board of Directors shall serve as an Appeals Board. The Appeals Board shall be comprised of the Chairman of the Authority Board of Directors and four other members of the Board of Directors selected by the Chairman.

108.2 Limitations on authority. An application for appeal shall be based on a claim that the intent of this code or the rules legally adopted hereunder have been incorrectly interpreted, the provisions of this code do not fully apply, or an equivalent method of protection or safety is proposed. The board shall have no authority to waive requirements of this code.

108.4 Requests for Hearing. Any person, including the Big Bear Fire Department ("fire department"), desiring a review or interpretation of the Fire Code may file a request with the Secretary of the Board of Directors for a hearing before the Appeals Board of the Big Bear Fire Authority within 15 days after the date such interpretation is rendered or enforcement began. The enforcement to be reviewed is suspended until the determination of the hearing unless a hazardous condition exists.

108.5 Hearing Procedures. Upon receipt of a request for a hearing before the Appeals Board, the Secretary of the Board of Directors shall fix the time and place of the hearing which shall be at a meeting of the Fire Authority held not less than 10 days nor more than 30 days after the date of the filing of the request for hearing. The Appeals Board shall give written notice of the time and place of the hearing to the initiating party and the fire code official involved. Witnesses may be sworn and evidence produced, and parties may be represented by counsel. The Appeals Board shall keep a record of the proceedings of each hearing and shall issue written findings and a decision within15 days after the conclusion of the hearing. The decision shall be mailed to the parties by first class mail, postage prepaid, at such addresses as they have provided.

108.6 Appeals to the Board of Directors. Any decision of the Appeals Board may be appealed to the full Authority Board of Directors. A request for such review shall be filed with the Secretary of the Board of Directors within 15 days from the date of the mailing of the Appeals Board decision. The full Fire Authority Board of Directors shall schedule a hearing at a regular meeting within 45 days after receipt of the request for appeal and shall issue a written decision within 30 days after the conclusion of that hearing. All such decisions shall be final and shall be mailed to the parties by first class mail, postage prepaid, at such addresses as they have provided.

108.7 Fees and Costs. The fire department involved (whether appellee or appellant) shall act as staff to the Appeals Board or to the Fire Authority Board of Directors, and for that purpose may determine and set fees to charge an appellant to cover the cost of preparation of the record for appeal. A summary of costs shall be compiled and sent to the appellant after all appeals have been exhausted. Any refund due the appellant shall be returned within 60 days after the summary is sent.

XI. Chapter 2 of the California Fire Code is hereby amended by adding the following definitions to Sections 202 to read as follows:

SECTION 202

DEFINITIONS

All Weather Driving Surface. Unless otherwise defined within other Codes, Rules, Standards or Regulations, the following are considered to be All Weather Driving Surfaces:

A. Three-inch (3") Type II A.C. pavement on four inch (4") crushed aggregate base.

B. Six-inch (6") Type II A.C. pavement on native soil.

C. Six-inch (6") Portland cement concrete pavement on native soil.

D. Any other surface as determined by the fire code official to meet the intent of this Code.

Barbecue Grill (also known as a barbeque or BBQ). A portable or fixed device, constructed of steel, concrete, clay, or other non-combustible material, for the primary purpose of cooking food over a liquefied petroleum-, natural gas-, or charcoal-fueled fire.

Barbecue Pit. A trench or depression in the ground in which wood or other clean solid fuel is burned to produce a bed of hot coals for the sole purpose of cooking. A barbecue pit having a fuel area greater than 3 feet in width or 2 feet in height shall be considered a bonfire.

Fire Code Official. Within the jurisdictional boundaries of the City of Big Bear Lake, the Fire Chief or other designated authority charged with the administration and enforcement of the code or a duly authorized representative. The Fire Code Official charged with the administration and enforcement of Chapters 7, 8, 9 and 10 of the current adopted California Building Code; Chapters 7, 8, 9 and 10 of the California Residential Code; and Chapters 7, 8, 9 and 10 of the California Fire Code; shall be the Chief Building Official.

Open Fires. Any outdoor fire, including open burning projects, recreational fires and bonfires, portable outdoor fireplaces, barbecues and barbecue pits, wherein products of combustion are emitted directly into the ambient air without passing through a stack or chimney from an enclosed chamber.

XII. Chapter 3, Section 304.3.5 is hereby added to The California Fire Code to read as follows:

304.3.5 Abatement. In the event that a fire hazard exists, as determined by the fire code official and in accordance with this chapter, the fire code official may give notice to the owner of the property upon which a hazardous condition exists to abate such condition. In the event that abatement is not performed within the time frames granted by such notices or other written documentation, the fire code official may cause abatement to be done in accordance with public nuisance abatement procedures and make the expense of such abatement a lien upon the property at which such condition exists.

XIII. Chapter 3, Section 305.3 of the California Fire Code is hereby amended to read as follows:

305.3 Open-flame Warning Devices. Open-flame warning devices shall not be used along an excavation, road or any other place where the dislodgment of such device may permit the device to roll, fall or slide onto any area or land containing combustible materials.

EXCEPTION: This section shall not apply to public safety personnel acting in the performance of their duties.

XIV. Chapter 3, Section 305.6 is hereby added to the California Fire Code to read as follows:

305.6 Spark Arrestors. Each chimney used in conjunction with a fireplace, outdoor fireplace, or other heating appliance in which solid fuel is burned, shall be maintained with an approved spark arrester. The spark arrester shall have heat and corrosion resistance equivalent to 12-gauge wire, 19-gauge galvanized wire or 24-gauge stainless-steel wire. Openings shall not permit the passage of spheres having a diameter larger than one-half inch (13 mm) maximum and shall not block the passage of spheres having a diameter of less than three-eighths inch (10mm). The screen shall be mounted in or over all outside flue openings in a vertical and near vertical position, adequately supported to prevent movement and shall be visible from the ground. All spark arrestors shall be accessible and removable for cleaning.

XV. Chapter 3, Section 307.1 of the California Fire Code is hereby amended to read as follows:

307.1 General. No person shall kindle, or maintain any fire, or allow any fire to be kindled or maintained on their property unless in accordance with this Code.

XVI. Chapter 3, Section 307.2 of the California Fire Code is hereby amended to read as follows:

307.2 Permit Required. When required pursuant to section 105.6.32, a permit shall be obtained from the appropriate fire code official as defined in Section 307.2.1 prior to kindling any open fire.

EXCEPTION: Barbecues utilizing natural gas, propane or charcoal briquettes used at one- and two-family dwellings unless otherwise regulated.

307.2.1 Authorization. Where required by state or local law or regulations, open burning shall only be permitted with prior approval from the state or local air and water quality management authority, provided that all conditions specified in the authorization are followed.

XVII. Chapter 3, Section 307.3 of the California Fire Code is hereby amended to read as follows:

307.3 Extinguishment Authority. The fire code official is authorized to order or cause the extinguishment of any fire that creates or adds to a hazardous condition, creates smoke emissions offensive to occupants of surrounding properties, is conducted without a permit when such a permit is required, or is conducted outside of the parameters set forth in this section or a permit, when required.

XVIII. Chapter 3, Section 315.7 is hereby added to the California Fire Code to read as follows:

315.7 Outside Storage of Firewood. Firewood and combustible material for consumption on the premises shall be neatly stacked free from accumulations of pine needles and other debris. Firewood that is used for private consumption is limited to five (5) cords.

XIX. Chapter 4, Section 403.12.1 of the California Fire Code is hereby amended to read as follows:

403.12.1 Fire Watch Personnel. When, in the opinion of the fire code official, it is essential for public safety in a place of assembly or any other place where people congregate, because of the number of persons, or the nature of the performance, exhibition, display, contest or activity, the fire code official may require, at the expense of the owner, agent or lessee, one or more fire department personnel to perform fire watch duties, as required and to remain on duty during the times such places are open to the public, or when such activity is being conducted.

EXCEPTION: The fire code official may require the owner, agent or lessee to provide one or more fire watch personnel.

XX. Chapter 5, Section 503.2.1 of the California Fire Code is hereby amended to read as follows:

503.2.1 Dimensions. Fire apparatus access roads shall have an unobstructed width of not less than 24 feet (7315.2 mm), exclusive of shoulders, except for approved security gates in accordance with Section 503.6, and an unobstructed vertical clearance of not less than 14 feet 6 inches (4450.08 mm).

EXCEPTIONS:

1. Driveways of one- and two-family dwellings shall be a minimum of 12 feet in width.

2. Driveways of one- and two-family dwellings exceeding 150’ in length shall be a minimum of 14 feet in width.

3. Required access road dimensions may be modified when, due to location on property, topography, waterways, nonnegotiable grades or other similar conditions, the fire code official determines that the conditions cannot be met.

XXI. Chapter 5, Section 503.2.3 of the California Fire Code is hereby amended to read as follows:

503.2.3 Surface. Fire apparatus access roads shall be designed and maintained to support the imposed loads of fire apparatus and shall be surfaced so as to provide all weather driving capabilities. Where road grades do not exceed eight percent (8%), and where serving only one- or two-family dwellings or accessory Group U occupancies, the fire code official may approve roads constructed with approved native materials or gravel compacted to eighty five percent (85%) compaction.

XXII. Chapter 5, Section 503.2.7 of the California Fire Code is hereby amended to read as follows:

503.2.7 Grade. The grade of the fire apparatus access road shall be within the limits established by the fire code official based on the fire department’s apparatus. Where driveways serving one- and two- family dwelling units have a driveway gradient exceeding twelve and one-half percent (12.5%), a separate emergency egress path of travel from the primary entrance of each dwelling it to the public way shall be provided. All components of the separate emergency egress path of travel shall comply with all applicable provisions of the California Building Code.

XXIII. Chapter 5, Section 503.4 of the California Fire Code is hereby amended to read as follows:

503.4 Obstruction of Fire Apparatus Access Roads. Fire apparatus access roads shall not be obstructed in any manner, including the parking of vehicles. The minimum widths and clearances established in Section 503.2.1 shall be maintained at all times. Any condition that serves as an impediment to fire access, or any vehicle or other obstruction to fire access may be removed at the order of the fire code official, with the expense of such removal to be paid by the owner of the roadway, or of said vehicle or obstruction.

XXIV. Chapter 5, Section 505.1 of the California Fire Code is hereby amended to read as follows:

505.1 Address Identification. Approved numbers or addresses shall be provided for all new buildings in such a position as to be plainly visible and legible from the street or road fronting the property. Address numbers and internal illumination shall be maintained.

The addresses for new dwellings shall be posted with a minimum of four inch (4") high numbers with proportionate width that are plainly visible from the street. During hours of darkness, the numbers shall be internally illuminated. Posted numbers shall be placed on a contrasting background. Where building setbacks exceed one hundred feet (100') from the street or road fronting the property, additional contrasting four inch (4") high numbers shall be displayed at the property entrance.

The addresses for new multi-family, new commercial and new industrial buildings shall be posted with a minimum of six-inch (6") high by three-quarters inch (3/4") stroke numbers. During the hours of darkness, the numbers shall be electrically illuminated. Where the building setback exceeds 200 feet from the roadway, additional non- illuminated contrasting six-inch (6") high by three-quarters inch (3/4") stroke numbers shall be displayed at the property entrance. New multi-family, new commercial and new industrial buildings shall display address/suite numbers or letters six-inch (6") high by three-quarters inch (3/4") stroke placed on a contrasting background on the front and rear doors of each suite/unit.

XXV. Chapter 5, Section 507.1 of the California Fire Code is hereby amended to read as follows:

507.1 Required Water Supply. An approved water supply capable of supplying the required fire flow for fire protection shall be provided to premises upon which facilities, buildings or portions of buildings are hereafter constructed or moved into or within the jurisdiction. In areas without a water purveyor capable of supplying the required fire flow, National Fire Protection Association Standard 1142 shall be used to establish on-site water storage capacities, when allowed by the fire code official.

EXCEPTION: For single one-and two-family dwellings and detached garages, not part of a parcel map, tentative tract or other similar planned development, an approved automatic residential fire sprinkler system or an approved self-contained residential automatic sprinkler system may be considered as an adequate water supply with no additional on-site water source required.

XXVI. Chapter 5, Section 507.3 of the California Fire Code is hereby amended to read as follows:

507.3 Fire Flow. Fire flow requirements for buildings or portions of buildings and facilities shall be determined by an approved method or Appendix B.

EXCEPTION:

1. For single one- and two-family dwellings and detached garages, not part of a parcel map, tentative tract or other similar planned development, the installation of an approved automatic residential fire sprinkler system or an approved self-contained residential automatic sprinkler system may be considered an approved fire flow.

13. No water supply or fire sprinkler system is required for detached Group U occupancies not used for industrial or commercial properties when structures are located 50 feet or further from the property lines and any dwelling.

XXVII. Chapter 5, Section 507.3.1 is hereby added to the California Fire Code to read as follows:

507.3.1 Inadequate Fire Flow. In areas which are unable to be provided with required fire flow, buildings shall be provided with an approved NFPA sprinkler system. On-site water storage requirements for occupancies other than group R, Division 3 may be reduced to a 30-minute minimum sprinkler demand.

XXVIII. Chapter 9, Section 903.2 of the California Fire Code is hereby amended to read as follows:

903.2 Where Required. Approved automatic sprinkler systems in new buildings and structures, including pre- manufactured structures, shall be provided in locations described in Sections 903.2.1 through 903.2.19.

XXIX. Chapter 9, Section 903.2.11.7 is hereby added to the California Fire Code to read as follows:

903.2.11.7 Building Fire Area 5,000 Square Feet or More in Size. An approved automatic fire sprinkler system shall be provided throughout in all newly constructed buildings and structures of any occupancy group when the gross fire area, as defined in the California Building Code, is equal to or exceeds 5,000 square feet.

EXCEPTIONS: Detached Group U occupancies accessory to a one- or two-family dwelling that are not used for commercial or industrial purposes.

XXX. Chapter 9, Section 903.2.11.8 is hereby added to the California Fire Code to read as follows:

903.2.11.8 Additions to Existing Buildings. When an addition to an existing structure results in the structure having a fire area greater than 5,000 square feet and such addition is 50% or more of the original square footage, the entire structure shall be provided with an automatic sprinkler system.

XXXI. Chapter 9, Section 903.7 is hereby added to the California Fire Code to read as follows:

903.7 Freeze Protection. All sprinkler systems shall be suitably freeze-protected for climatic conditions as prescribed by the fire code official.

XXXII. Chapter 34, Section 3405.1 of the California Fire Code is hereby amended to read as follows:

3405.1 Individual Piles. Tires shall be restricted to individual piles not exceeding 2,500 square feet of continuous area. Pile width shall not exceed 50 feet. Piles shall not exceed 25,000 cubic feet in volume or 10 feet in height.

XXXIII. Chapter 49, Section 4901.3 is hereby added to the California Fire Code to read as follows:

4901.3 Fire Protection Plan. A Fire Protection Plan (FPP), approved by the fire code official, shall be required for all new developments within declared fire overlay districts. The FPP shall include mitigation measures consistent with the unique problems resulting from the location, topography, geology, flammable vegetation and climate of the proposed site. The FPP shall address water supply, access, building ignition and fire resistance, fire protection systems and equipment, defensible space and vegetation management. The FPP shall be consistent with the City of Big Bear Lake Development Code, or, at the option of the fire code official, with other nationally recognized standards and good practice.

XXXIV. Chapter 49, Sections 4906 of the California Fire Code is hereby amended to read as follows:

4906.1 General. Hazardous vegetation and fuels shall be managed to reduce the severity of potential exterior wildfire exposure to buildings and to reduce the risk of fire spreading to buildings in accordance with Section 4906.3.

4906.2Application. Those areas protected by the Big Bear Fire Authority shall be classified as a *Very High Fire Hazard Severity Zone.*

4906.3 Requirements. It shall be the responsibility of every property owner, occupant and person in control of any land interest to abate the accumulation of forest fuels around their property, through implementation of measures as identified in Chapter 17.10 of the City of Big Bear Lake Municipal Code.

XXXV. Chapter 56, Sections 5601.2 through 5601.2.6 are hereby added to the California Fire Code to read as follows:

5601.2 Permit Required. Permits shall be obtained from the San Bernardino County Sheriff's Department ("sheriff's department"):

1. To manufacture, possess, store, sell, display or otherwise dispose of explosives, blasting agent or phosphoric compounds.

2. To transport explosives or blasting agents.

3. To use explosives or blasting agents.

4. To operate a terminal for handling explosives or blasting agents.

5. To deliver or receive explosives or blasting agents from a carrier at a terminal between the hours of sunset and sunrise.

6. To transport blasting caps or electric blasting caps on the same vehicle with explosives.

5601.2.1 In addition to the requirements set forth in this article, the sheriff's department or the fire department may, for the safety and security of the public, set additional requirements for a permit application.

The sheriff's department shall notify the fire department when any application has been made for an explosives permit for a specific location and purpose. No permit shall be issued without the approval of the fire department.

5601.2.2 Seizure. The fire code official is authorized to remove or cause to be removed or disposed of in an approved manner, at the expense of the owner, explosives, explosive materials or fireworks offered or exposed for sale, stored, possessed or used in violation of this chapter.

5601.2.3 Storage and Transportation of Explosives and Blasting Agents. The storage and transportation of explosives and blasting agents is prohibited in residential areas, principal business districts, closely-built commercial areas and heavily-populated areas, except as permitted by the sheriff's department and the fire department in accordance with California Code of Regulations, Title 19, and Title 4, Division 5 of the San Bernardino County Code.

5601.2.4 Magazine Size. Indoor magazines shall not be of a size greater than the exit door or contain more than 50 pounds of explosive materials.

5601.2.5 Black Powder. The amount of black powder stored in an indoor magazine shall not exceed 50 pounds.

5601.2.6 Notification. When blasting is being conducted in the vicinity of gas, electric, water, fire alarm, telephone, telegraph or stream utilities, the blaster shall notify the appropriate representative of such utilities at least 24 hours in advance of blasting specifying the location and intended time of such blasting.

EXCEPTION: In an emergency, advance notification may be waived by the fire code official.

XXXVI. Chapter 57, Section 5704.2 of the California Fire Code is hereby amended to read as follows:

5704.2 Tank Storage. Pursuant to Section 5704 of the California Fire Code, the storage of flammable and combustible liquids in outside above ground unprotected tanks and below grade vaulted tanks are prohibited in all commercial occupancy areas, developed residential areas, and other areas where the Chief having jurisdiction determines that the installation of flammable and combustible above ground storage tanks or below grade vaulted tanks will create a hazard to occupants and property owners in the area. Deviation from these requirements may be allowed only upon specific written findings by the fire code official.

XXXVII. Chapter 80, Section 6.1.2 of NFPA 13D a Referenced Standard of the California Fire Code is hereby amended to read as follows:

6.2.2.1 Where stored water is used as the sole source of supply for the sprinkler system, the minimum quantity shall equal the water demand rate times 10 minutes.

XXXVIII. Chapter 80, Section 6.2.4 of NFPA 13D a Referenced Standard of the California Fire Code is hereby deleted.

XIL. Appendix B, Section B105.2 of the California Fire Code is hereby amended to read as follows:

B105.2 Buildings Other than One-and Two-Family Dwellings. The minimum fire flow and flow duration for buildings other than one- and two-family dwellings shall be as specified in TableB105.1.

EXCEPTION: A reduction in required fire flow of up to 50 percent, as approved, is allowed when the building is provided with an approved automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2. A reduction in required fire flow of up to 75 percent is allowed for isolated buildings of Group U occupancy, agricultural uses, or other low hazard uses when approved by the fire code official. The resulting fire flow shall not be less than 1,500 gallons per minute (5678L/min) for the prescribed duration as specified in Table B105.1.

XL. Appendix C, Section C102 of the California Fire Code is hereby amended to read as follows:

C102 Minimum Number of Fire Hydrants for a Building. The number of fire hydrants available to a complex or subdivision shall not be less than that determined by spacing requirements specified in Section C105.1 when applied to fire apparatus access roads and perimeter public streets from which fire operations could be conducted.

XLI. Appendix C, Section 103.1 of the California Fire Code is hereby amended to read as follows:

C103.1 Hydrant Spacing. The average spacing between fire hydrants shall not exceed 300 feet (91m) in industrial, commercial, and multifamily development, and 600 feet (183m) in all single-family developments. Spacing of fire hydrants along public streets shall also be guided by other County or Authority public works standards.

EXCEPTION: The fire code official is authorized to accept a deficiency of up to10 percent where existing fire hydrants provide all or a portion of the required fire hydrant service.

XLII. Appendix C, Table C102.1 of the California Fire Code is hereby deleted.

Section 10. Section 15.52.030 of the City of Big Bear Lake Municipal Code is hereby amended in its entirety to read as follows:

15.52.030 - Review and inspection by director of building and safety—Report.

Upon the filing of the application and payment of the filing fee, the application shall be referred to the director of building and safety who shall within five days make an inspection of the building or structure to be moved, or review in other appropriate form to assure that city-adopted standards or units certified under the National Mobile Home and Construction Safety Standards Act of 1974 on a foundation can be satisfied, and report to the planning commission. The report to the planning commission shall include the type of construction, age and present condition of such building or structure and any improvements recommended or required to be made. The director of building and safety may recommend denial of the application if, in his opinion, the above-mentioned factors warrant or require such denial of the building or structure being moved on to a lot or parcel in the city. Further, no approval shall be given to move any building which is sufficiently heavy to injure any street or pavement within the city, or the size of which will unduly obstruct traffic upon the city streets.

(Ord. 81-44 § 2(b), 1981)

Section 11. Chapter 8.91 of the City of Big Bear Lake Municipal Code is hereby amended in its entirety to read as follows:

8.91.010 – International Property Maintenance Code adoption—Copies on file.

A. The city of Big Bear Lake adopts in its entirety the 2018 International Property Maintenance Code (IPMC), including appendix A, subject to the amendments, additions, and deletions set forth in this chapter. The IPMC will apply to all occupancies identified by the California Building Code.
B. One copy of the IPMC is on file in the office of the City Clerk and Building Department, which is available for public viewing as required by law.

(Ord. 2008-383 § 2, 2008: Ord. 88-157 §§ 1, 5, 1988)

8.91.020 - Funding for administration and enforcement.

The City of Big Bear Lake shall appropriate sufficient funds for the administration and enforcement of such code.
(Ord. 88-157 § 2, 1988)

8.91.030 - Board of appeals.

The city shall, by resolution, appoint a five-person board of appeals in conformity with Section 205 of said code. Such resolution shall include the compensation, if any, of such board.

(Ord. 88-157 § 3, 1988)

8.91.040 - Claims for costs and expenses.

The fees for activities and services performed by the department in carrying out its responsibilities under the IPMC shall be per the most recent adopted fee schedule adopted by the City of Big Bear Lake City Council. Any and all costs incurred by the city in connection with securing lawful entry to a structure or premise including but not limited to, costs of investigation, staffing costs incurred in the preparation of warrants, and all subsequent costs necessary to enforce compliance with the provisions of this Code may be recovered including late payment charges and costs of collection by use of any and all available legal means. Recoverable costs incurred by the city shall include those of the director of administrative services and the city attorney, if such expenses are determined reasonable and necessary, and such costs reported by the director of public works shall be identified separately from all other expenses. A separate statement of the director of administrative services and, as applicable, the city attorney shall be attached where such costs and expenses are claimed. Such expenses shall likewise include the costs of the appeals board, if convened.

(Ord. 2008-383 § 3, 2008: Ord. 88-157 § 4, 1988)

8.91.050 - Amendments to the International Property Maintenance Code.

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Chapter15.33 of the City of Big Bear Lake Municipal Code contains the amendments made with the adoption of the IPMC and shall be referenced from that chapter.

(Ord. 2008-383 § 4, 2008)

Section 12. All former ordinances or parts conflicting or inconsistent with the provisions of this ordinance or any other ordinances in conflict herewith are hereby repealed.

Section 13. If any provisions of this ordinance or application thereof to any person or circumstances are held invalid, this invalidity shall not affect other applications of this ordinance which can be given effect without the invalid provision or applications, and to this end, the provisions of this ordinance are declared to be severable. This ordinance shall be liberally construed to achieve the purposes of this ordinance and to preserve its validity.

Section 14. The City Council hereby finds and determines that it can be seen with certainty that there is not possibility that this ordinance may have a significant adverse effect on the environment, since it adopts updated building and safety standards which the District had previously adopted in substantial form. Thus, the adoption of this ordinance is exempt from the requirements of the California Environmental Quality Act (CEQA) pursuant to Section 15061(b) (3) of the CEQA Guidelines. Staff is directed to file a Notice of Exemption.

Section 15. Effective Date. This ordinance shall become effective thirty (30) days following its adoption.

Section 16. Publication. The City Clerk shall certify to the adoption of this ordinance. Not later than fifteen (15) days following the passage of this ordinance, the ordinance, or a summary thereof, along with the names of the City Council members voting for and against the ordinance, shall be posted in at least three public places in the City in lieu of publication unless publication is requested by the City Council or otherwise required by law.

PASSED, APPROVED AND ADOPTED this 28th day of October 2019.

AYES:	Herrick, Jahn, Caretto, Jackowski, Putz
NOES:	None
ABSTAIN:	None
EXCUSED:	None

Randall Putz,

Mayor ATTEST:

Erica Stephenson
City Clerk

APPROVED AS TO FORM:

Stephen P. Deitsch
City Attorney

STATE OF CALIFORNIA - COUNTY OF SAN BERNARDINO - CITY OF BIG BEAR LAKE)

I, Erica Stephenson, City Clerk of the City of Big Bear Lake, California, do hereby certify that the whole number of the City Council of the said City is five; that the foregoing Ordinance No. 2019475 is a full, true and correct original of Ordinance No. 2019-475 of the City of Big Bear Lake, entitled:

AN ORDINANCE OF THE CITY OF BIG BEAR LAKE, COUNTY OF SAN BERNARDINO, STATE OF CALIFORNIA, REPEALING ORDINANCE 2016-453 AND 2008-383 AND ADDING AND AMENDING TITLE 8 AND 15 OF THE BIG BEAR LAKE MUNICIPAL CODE PERTAINING TO THE CONSTRUCTION AND MAINTENANCE OF BUILDINGS, HOUSING, ABATEMENT OF DANGEROUS BUILDINGS, AND FIRE PREVENTION BY ADOPTING THE 2019 CALIFORNIA BUILDING STANDARDS CODE AS FOUND IN TITLE 24 OF THE CALIFORNIA CODE OF REGULATIONS COMPRISING THE CALIFORNIA BUILDING CODE, VOLUMES 1 & 2, AND APPENDICES B, H, & J OF VOLUME 2, 2019 EDITION; THE CALIFORNIA RESIDENTIAL CODE AND APPENDICES H & O, & V, 2019 EDITION; THE CALIFORNIA ELECTRICAL CODE, 2019 EDITION; THE CALIFORNIA MECHANICAL CODE, 2019 EDITION; THE CALIFORNIA PLUMBING CODE, 2019 EDITION; THE CALIFORNIA ENERGY CODE, 2019 EDITION; THE CALIFORNIA HISTORICAL BUILDING CODE, 2019 EDITION; THE CALIFORNIA GREEN BUILDING STANDARDS CODE, 2019 EDITION; THE CALIFORNIA FIRE CODE AND APPENDICES CHAPTER 4, A, B, BB, CC, D, H, I & J AND ERRATA, 2019 EDITION; THE CALIFORNIA EXISTING BUILDING CODE, 2019 EDITION; THE CALIFORNIA REFERENCE STANDARDS CODE, 2019 EDITION; ADOPTING BY REFERENCE TABLES 3A THROUGH 3H OF THE UNIFORM ADMINISTRATIVE CODE, 1997 EDITION, EDITION; THE INTERNATIONAL PROPERTY MAINTENANCE CODE, 2018EDITION

Was duly passed and adopted by the said City Council, approved and signed by the Mayor of said City, and attested by the City Clerk of said City, all at a regular meeting of said Council on the 28th day of October, 2019, and that the same was so passed and adopted by the following vote:

AYES:	Herrick, Jahn, Caretto, Jackowski, Putz
NOES:	None
ABSTAIN:	None
EXCUSED:	None

I do hereby further certify that pursuant to the provisions of Section 36933 of the Government Code of the State of California that the foregoing Ordinance No. 2019-475 was duly and regularly published according to law and the order of the City Council and circulated within said City.

Erica Stephenson, City Clerk

Erica Stephenson

APPENDIX G

[ON FOLLOWING PAGE]

APPENDIX G

Model Water Efficient Landscape Ordinance (MWELO)

About MWELO

About MWELO

New Law, New Opportunities

The California Landscape Contractors Association was involved in the creation of the Water Conservation in Landscaping Act (Assembly Bill 325, Clute), which was signed in to law in 1990. This led to additional work 14 years later on Assembly Bill 2717, which passed in 2004. This bill requested that the California Urban Water Conservation Council (CUWCC) convene a stakeholder task force, comprised of public and private agencies, to re-evaluate landscape water conservation and recommend proposals for improving the efficiency of water use in new and urban landscapes in California.

CLCA led the way in developing and launching a performance-based landscape water certification program for the industry (the CLCA Water Management Certification Program) in late 2007. This became only the fourth EPA Water Sense approved certification in the nation in 2010.

In 2006, CLCA was a critical stakeholder in meetings that led to the Water Conservation in Landscaping Act of 2006 (Assembly Bill 1881). This bill set a deadline for the California Department of Water Resources (DWR) to update the Model Ordinance in accordance with specified provisions from AB 2717. It also required local agencies to adopt the Model Ordinance or to create their own local equivalent. This all laid the foundation for the current version of the Model Water Efficient Landscape Ordinance (MWELO).

CLCA was virtually the only green industry representation in that process, and we worked hard to represent the interests of our members. CLCA won the battle to only recommend that trees be on their own irrigation valves and irrigation audits could be done by certified installers. CLCA did not win the fight for 24-inch setback for overhead

sprinklers along any hardscape area. Overall, CLCA's main position through the process was to not restrict plant material and focus on water budgets to prevent an overly cumbersome and bloated ordinance.

In 2013, CLCA was represented by Life Member Peter Estournes on DWR's Independent Technical Panel (ITP). This panel convened some of California's best industry minds to focus on landscape water efficiency. Through 2013, the panel made numerous recommendations to the state. Peter was also later selected to participate on the Urban Advisory Group to work on the implementation of several parts of Gov. Brown's executive order #B-37-16, "Making Water Conservation a California Way of Life."

CLCA and its Resource Management Committee are a part of the new MWELO Landscape Stakeholder Advisory Group (LSAG) and continue to be vital part of new state bills that concern landscape or irrigation in California like 2016's AB 814, AB 1928 and AB 2525.

Legislation

D W R
Soil

Resources

APPENDIX H

[ON FOLLOWING PAGE]

APPENDIX H

BIG BEAR VALLEY
MOUNTAIN MUTUAL AID ASSOCIATION
P. O. BOX 6627
Big Bear Lake, CA 92315

GENERAL MEETING
MINUTES

DATE: **Tuesday, October 9, 2018**
TIME: **0900 Hours**

LOCATION: **Friends of the Disaster Center – EOC building**

Call to Order

Paul Marconi, Bear Valley Electric, called the meeting to order at 9:03 a.m.

Flag Salute

Paul Marconi, lead the flag salute.

Approval of Minutes

Hank Peralez, Friends of the Disaster Center made a motion to accept the August 14, 2018 MMA Meeting Minutes; seconded by **Phil Mosley, City of Big Bear Lake.** The motion was approved unanimously to accept the minutes as presented.

Approval of the Treasurer's Report – Hank Peralez

As of September 2018, the Big Bear Valley financials are $2,778.00. The painting of the building was delayed due to the thunderstorms but it was finally completed.

They do not include the last deposit of $6,125.00 of incoming dues. In addition, I will have the following checks to be signed: Q1 and Q2 utilities for $2,681.41 (this includes BBCCSD's water stand by fee and our every 5th year water system inspection), Q3 utilities for $895.68, and $4,687.50 (which is 75% of the painting cost of $6,250.00). These are not included in the report either.

Correspondence – None

Unfinished Business – None

New Business –

Election of Big Bear Valley Mountain Mutual Aid 2019 -2021:

Paul Marconi, Bear Valley Electric elected unanimously as President
Phil Mosley, City of Big Bear Lake, elected unanimously as Vice President
Sierra Orr, Big Bear Lake DWP, elected unanimously as Treasurer
Yomar Cleary, Big Bear Valley COAD, elected unanimously as Secretary

Self-Introductions/ Open Forum

Paul Marconi, Bear Valley Electric –

- Pole Loading Program – Working on pole circuit replacement and rerouting poles.
- Establishing a high fire safety program to turn off power to prevent fire from developing.
- Monitoring the Airport weather station-in the last 4-1/2 years there has been only 3 instances that power had to be turn off due to high winds.
- Bear Valley Electric has identified seven power stations to de-energize during extreme weather conditions. California requires that poles can sustain 65-85 winds per hour – our poles are designed to sustain these winds. Power would be turned off' in rotating sections.

Yomar Cleary, Big Bear Valley COAD

- Had a meeting on Friday, October 5th with COAD members and reviewed how COAD is part of San Bernardino County VOAD. In order to find resources in the Valley we need organizations to fill out the membership application showing what resources and not wait until those resources are need during an event.

Phil Mosley, City of Big Bear Lake –

- Stated that he and Mike Maltby, Big Bear Fire Department are working together to update the Hazard Mitigation Plan for the entire Valley and not just for the City of Big Bear Lake. Phil asked everyone in attendance if anyone had anything to offer towards the Plan to get in touch with him or Mike Maltby. Sierra Orr stated she would like to see the plan and contribute towards the Plan
- At the October 22, 2018 City Council meeting will be announcing that a Traffic Management Consultant has been hired who will presenting a winter traffic circulation plan to help with the local resort weekender/holiday traffic. The City has obtained a dedicated tow truck service and tow yard which they did not have last year.

Hank Peralez – Friends of the Disaster Center & Civil Air Patrol –

- Announced that the Civil Air Patrol building was finally painted. MMA is paying 75% of the $6,250.00 cost to paint the building
- Hank stated that the Civil Air Patrol during the fiscal year of October 2017 and October 2018 have conducted 155 search & rescue missions and saved lives. Working the Village Halloween for lost "parents".

Heidi Markus – Bear Valley Health Care District – Heidi announced that the hospital is going through renovations in the Emergency Department. They are adding new cabinets, flooring and painting. What should have taken 6 weeks might take 12 weeks to complete. Hope to complete by Thanksgiving. Participating in a Statewide medical exercise on November 15th.

Sierra Orr – City of Big Bear Lake DWP

- DWP is implementing E-Billing for their customers
- Replacing old pipelines through a 12-million-dollar loan of which 3 million will be in grants.
- DWP will be installing a solar field by the Convention Center

Mike Maltby – Big Bear Fire Department

- Working with the City of Big Bear Lake on finalizing the Hazard Mitigation Plan
- Planning for winter activities. Fire season is not over yet; we need to be alert.

Jim Helm CHP –

- CHP working with Caltrans on keeping the roads open
- Should we have a fire in the mountains, keeping the traffic moving
- Preparing for the winter visitors
- Lt. Mike Salinas is now the Running Springs CHP Commander

Mary Reeves – Big Bear City CSD –

- Water Department is working on the 20-year Master Plan
- Sewer Department is replacing valves and pumps at Division Lift Station
- Solid Waste on Saturday October 13th at the Paradise Yard accepting large items for disposal
- Administration is working on our financial audit from last year.

John Velarde – Mountain Transit – Is the new Lead Maintenance Technician.

DISASTER PREPAREDNESS VIDEO

Very informative video addressing the use of ICS, SEMS and NIMS,

The meeting was adjourned at 10:35 am – Phil Moseley made a motion to close the meeting and Hank Peralez second the motion and the motion was unanimously approved. The next MMA meeting will be Tuesday, February 12, 2019.

Yomar Cleary
MMA Secretary

Agency Attendance:

Bear Valley Healthcare District	Heidi Markus
Bear Valley Electric	Paul Marconi
Big Bear Fire Department…….	Mike Maltby
Big Bear Valley COAD	Yomar Cleary
Big Bear City, CSD	Mary Reeves
Big Bear Lake DWP	Sierra Orr
California Highway Patrol	Jim Helm
City of Big Bear Lake	Phil Mosley
Civil Air Patrol	Alan Hay
Friends of the Disaster Center	Hank Peralez
Mountain Transit	John Velarde

Guests:

Agencies not in Attendance:

American Red Cross/CERT	Erin Fox
BBARWA	Dave Lawrence
Big Bear Municipal Water District	Dave Henderson
Big Bear Chamber of Commerce	Stephanie Thoth
Bear Valley Parks & Rec.	Reese Troublefield, Lorie Judd
Bear Valley Unified School District	Shelli Black & Kyle Walker
Big Bear Airport District	Adam Haidinyak
Cal Fire	Mark Barr
Caltrans	Jeff Veik & Travis Thogmartin
San Bernardino County Fire	Dino DeMarco Station 96
Rim Mountain Mutual Aid	Aaron M. Scullin
San Bernardino Big Bear Sheriff Station	Captain Mitch Dattilo
San Bernardino County Roads	Jim Dibel
San Bernardino County Fire – OES	John Ferdon
San Bernardino Health Preparedness & Response	Justin Hutton
Southern California Edison	Juan M. Lopez
Southwest Gas	Andy Hallman
Thomas Gas	David Calhoun
U. S. Forest Service	Dave Kelly

BIG BEAR VALLEY
MOUNTAIN MUTUAL AID ASSOCIATION
P. O. BOX 6627
Big Bear Lake, CA 92315

GENERAL MEETING
MINUTES

DATE: **Tuesday, February 12, 2019**
TIME: **0900 Hours**

LOCATION: **East Mountain Incident Management Center**

Call to Order

Paul Marconi, Bear Valley Electric, called the meeting to order at 9:03 a.m.

Flag Salute

Paul Marconi, lead the flag salute.

Approval of Minutes

The October 9, 2018 MMA meeting minutes were presented for approval Dawn Marschinke made a motion to approve and Phil Mosley, second the motion. Approval of the minutes was unanimous.

Approval of the Treasurer's Report – Hank Peralez

Hank Peralez, Friends of the Disaster Center – Was not in attendance so no Treasurer's report was given.

Correspondence – None

Unfinished Business – None

New Business –

Presentation incoming MMA officers:

Paul Marconi, Bear Valley Electric elected unanimously as President
Phil Mosley, City of Big Bear Lake, elected unanimously as Vice President
Sierra Orr, Big Bear Lake DWP, elected unanimously as Treasurer
Yomar Cleary, San Bernardino County VOAD elected unanimously as Secretary

Self-Introductions/ Open Forum

Paul Marconi, Bear Valley Electric –

- Establishing a high fire safety program to turn off power to prevent fire from developing
- The recent storms have not created havoc
- Working on the Solar Project with BBARWA, it will be an 8 Megawatts solar power

Phil Mosley, City of Big Bear Lake –

- Meeting lots of challenges with snow and visitors in the Valley. 100,000 people over a weekend.

Justin Hutton, SBC Dept of Health, Preparedness & Response

- Introduced a new staff members Vanessa Morales
- No updates at this time

David Lawrence – BBARWA

- No updates at this time

Sierra Orr – City of Big Bear Lake DWP

- Replacing old pipelines through a 12-million-dollar loan of which 3 million will be in grants.
- DWP will be installing a solar field by the Convention Center

Chris Higgins – Southwest Gas Corp.

- Operation and Maintenance of equipment

Ron Janssen, Division Chief, Cal Fire & Brett Taylor, Battalion Chief

- Department of Forestry and Fire Protection, San Bernardino Unit
- MMA wish to "Thank" them for shoveling snow to the entrance of the building so we could have today's meeting!!!

Tim Bowmal- Municipal Water District

- Getting ready for summer fishing and boating

Steve Brouard – Mountain Transit

- No updates to report at this time

Lorie Judd, Big Bear Valley Parks & Rec.

- Reese Troublefield who oversees all the Parks & Rec in the County will be retiring and so is his boss.
- The new Zoo facility will be opening Labor Day

Dawn Marschinke, & Assistant Fire Chief Mike Maltby, Big Bear Fire District

- Busy procuring grants to remove hazardous trees
- The Big Bear Fire District has taken over the Civil Air Patrol building
- Keeping very busy with the influx of visitors in the Valley to play in the snow.

Bill Treadwell, Big Bear Valley COAD & VOAD

- Gave an overview of what is COAD and VOAD
- Announced that Yomar Cleary is now the Chair for the SBC VOAD and he is Co-Chair.

Mary Reeves – Big Bear City CSD –

- Water Department is working on the 20-year Master Plan
- Solid Waste has its first automated truck collection
- Administration is working on our financial audit from last year.

Captain Mitch Dattilo & Lt. Ryan Collins – SBC Sheriff

- The snow traffic plan is working fairly well
- There have been 23,000 vehicles a day, which equates to 100,000 people visiting the Big Bear Valley.

Matt McCabe, Big Bear Visitor Bureau

Dino DeMarco- S.B. County Fire Mountain Division

- The Fire Station in Fawnskin has acquired a snow cat which they have used in several rescues.

Terry McDonald, Big Bear Mountain Resorts

- Asked the group how Big Bear Mountain Resorts could help since they are responsible for all the visitors that are coming up to play in the snow.
- Mountain Resorts has put together a team to go out and pick up trash that our visitors leave.

Erin Fox – American Red Cross

- American Red Cross working with the Fire Department are installing fire alarms in the Whispering Forest Mobile home park on April 27th and need volunteers to help install and instruct the homeowners. Yomar will send out a flyer whereby people can click on the URL to register to volunteer.

Tad Chavez (Division 1) U. S. Forest Service

- There are 700 acres of piles that need to burn. If you see smoke, we will be burning Monday through Thursday while the weather is cold.

Big Bear Valley Emergency Evacuation Plan
Sheriff Captain Mitch Datillo

Captain Datillo stated that they would prefer not to evacuate the Big Bear Valley but if needed to, the Sheriff Department works very well with the Fire District and Cal Fire as a Unified Command. The decision to evacuate comes from Fire Departments and the Forest Service. As of now the San Bernardino County Sheriff Department has 19 aircraft. Sheriff helicopters now have large buckets to scoop water to help fight fires.

He addressed the 2003 wild land fire that consumed 91,281 acres burned, 993 homes destroyed, six deaths, thousands displaced from their homes and $43 million + in costs. 2007 Wild Land Fires, 15,000+ acres burned 376 homes destroyed and thousands displaced from their homes.

Contributing factors to large wild land fires are: Santa Ana winds, drought conditions, arson, traffic collisions. He went on to say that all agencies are doing a better job in controlling fires because they have more assets, local tanker base, sheriff firefighting assets and unified command.

Unified Command – all mutual aid partners. Fire orders evacuations and Sheriff conducts the evacuations. Evacuations preserve life; Security preserve property; traffic control ingress & egress and lastly re-population process. Evacuations begin with preparedness. Have a personal plan.

If you want to keep up with what is happening in your area, Captain Datillo suggested subscribing to TENS/NIXEL Listen to County OES emergency broadcast system by sending text messages and social media to find out what is happening in your area.

Paul Marconi asked for adjourning of meeting. Phil Mosley made a motion to adjourn and Sierra Orr second the motion and the motion carried. The meeting adjourned at 9:45 am.

The meeting was adjourned at 9:35 am – Phil Moseley made a motion to close the meeting and Sierra Orr second the motion and the motion was unanimously approved. The next MMA meeting will be Tuesday, April 9, 2019.

Yomar Cleary
MMA Secretary

Agency Attendance:

American Red Cross/CERT	Erin Fox
BBARWA	Dave Lawrence
Big Bear Municipal Water District	Tim Bowmal
Big Bear Visitor Bureau	Matt McCabe
Big Bear Valley Parks & Rec.	Lorie Judd
Bear Valley Electric	Paul Marconi
Big Bear Fire Department…….	Mike Maltby & Dawn Marschinke
Big Bear Valley COAD/VOAD	Yomar Cleary & Bill Treadwell
Big Bear City, CSD	Mary Reeves & Gavin Heilman
Big Bear Lake DWP	Sierra Orr
Cal Fire	Ron Janssen & Brett Taylor
City of Big Bear Lake	Phil Mosley
Mountain Transit	John Velarde
San Bernardino County Fire	Dino DeMarco Station 96
San Bernardino Big Bear Sheriff Station	Capt Mitch Dattilo &Lt. Ryan Collins
San Bernardino Health Preparedness & Response	Justin Hutton & Vanessa Morales
Southwest Gas	Chris Higgins
U. S. Forest Service	Thad Chavez

Guests:

Agencies not in Attendance:

Bear Valley Healthcare District	Heidi Markus
Big Bear Chamber of Commerce	Stephanie Thoth
Bear Valley Unified School District	Shelli Black & Kyle Walker
Big Bear Airport District	Jack Roberts
California Highway Patrol	Jim Helm
Caltrans	Jeff Veik & Travis Thogmartin
Civil Air Patrol	Alan Hay
San Bernardino County Roads	Jim Dibel
San Bernardino County Fire – OES	John Ferdon
Southern California Edison	Juan M. Lopez
Thomas Gas	David Calhoun

BIG BEAR VALLEY
MOUNTAIN MUTUAL AID ASSOCIATION
P. O. Box 6627, Big Bear Lake, CA 92315

GENERAL MEETING AGENDA

DATE: **April 9, 2019**
TIME: **0900 Hours**
LOCATION: **Civil Air Patrol –East Mountain Incident Management Center**
100 W. Meadow Lane
Big Bear City, CA

Call to Order

Pledge of Allegiance

Self-Introductions – Agencies/Organizations Give Updates

Approval of February 12, 2019 Big Bear Valley MMA Minutes;

Treasurer's Report & Approval – Sierra Orr, Treasurer at a conference this week

Communications – none

PRESENTATION

Peter Saavedra -- Hazardous Materials Specialists.

The presentation will be an Overview of the County Fire Hazmat Division Emergency Response Team, training and capabilities.

Unfinished Business

- Phil Mosley, Vice President of MMA, Hazardous Mitigation Plan Update progress

New Business – none

Adjournment

BIG BEAR VALLEY
MOUNTAIN MUTUAL AID ASSOCIATION
P. O. BOX 6627
Big Bear Lake, CA 92315

GENERAL MEETING
MINUTES

DATE: **Tuesday, April 9, 2019**
TIME: **0900 Hours**
LOCATION: **East Mountain Incident Management Center**

Call to Order

Paul Marconi, Bear Valley Electric, called the meeting to order at 9:03 a.m.

Flag Salute

Paul Marconi, lead the flag salute.

Approval of Minutes

The February 12, 2019 MMA meeting minutes were presented for approval Dawn Marschinke made a motion to approve and Phil Mosley, second the motion. Approval of the minutes was unanimous.

Approval of the Treasurer's Report – Sierra Orr

Sierra Orr, Treasurer, was not at the meeting but submitted a treasurer report that was email to the membership. The ending 2018 balance was $19,266.02 with an expenditure for painting the outside of the building of $2778 and $10,625 in 2018 dues. The ending balance was $27,016.55.

Paul Marconi announced that the Friends of the Disaster Center have dissolved their nonprofit status and some of that funding has been deposited into the Big Bear Valley MMA treasury. Some of the funds will be used for the upkeep of the building.

Correspondence – None

Unfinished Business - Phil Mosley, Vice President of MMA, is working with local entities on updating the Hazardous Mitigation Plan

New Business – None

Self-Introductions/ Open Forum

Paul Marconi, Bear Valley Electric –

- Filed an application to build a Solar Project a combined effort between BBARWA and Bear Valley Electric. It will be an 8 Megawatts solar power.
- Have installed ten weather stations throughout Big Bear Valley for better weather forecasting. Provided this information to NOAA and Ben Brissey, local weatherman.
- Per PUC guidelines, we are working on preventing sparks from our lines

Phil Mosley, City of Big Bear Lake –

- As mentioned before, working on the Hazardous Mitigation Plan.

Michael Mursick – Bear Valley Health Care District

- Stated that Heidi Markus Director of Emergency Services & Preparedness has resigned.
- Introduced Joanne Merrill, Clinic Programs Coordinator and Jacob Phillips who will be attending the MMA meetings.

Dawn Marschinke, & Assistant Fire Chief Mike Maltby, Big Bear Fire District

- Announced that the Chipping program will start on April 15th.
- Fire will host the May 14th Chamber Mixer at Sonora Cantina
- Holding meetings with regards to the closing of the Sugarloaf Fire Station

Phillip Petteruto – Southwest Gas

- High-pressure gas line going across the lake from Lakeview to Holcomb Valley removal permit has been postpone til next year. Glad the gas line was not exposed while the Lake was so low.

Bill Treadwell, Big Bear Valley COAD & VOAD

- Asked if there was a program to remove a tree that is leaning towards his home. Dawn Marschinke from Big Bear Fire stated she did not know if there was funding or not.

Shelli Black – Bear Valley Unified School District

- Getting ready to incorporate 6th graders into Junior High
- The student enrollment is down – They have 2400 students registered
- Problem being there is no housing so families are moving off the mountain

Battalion Chief Steven Tracy – San Bernardino County fire Protection District Mountain Division 3

- Announced changes with the Mountain Division 3. Add: Division Chief Ron Walls; Battalion Chief Anthony Rapoza and Battalion Chief Bob Evans.

Eric Steel and Dede Hermon – Big Bear Valley CERT

- Dede Hermon announced that they are hosting a repeater for CERT that can be used during disaster events.

John Ferdon – SB County Fire – Office of Emergency Services

- Welcome to the Big Bear Valley MMA Meeting

Erin Fox & Tom Hyatt– American Red Cross

- American Red Cross working with the Fire Department are installing fire alarms in the Whispering Forest Mobile home park on April 27th and need volunteers to help install and instruct the homeowners. Yomar will send out a flyer whereby people can click on the URL to register to volunteer.

Ron Janssen, Division Chief, Cal Fire Mountain Div. & Fire Captain Keith Bickford

- Department of Forestry and Fire Protection, San Bernardino Unit

Shane Massoud & Emily Leinen – Caltrans Public Information Officers

- A **guardrail installation and terminal end treatment project on SR 18** in Running Springs begins April 10, with a one-way flagging operation in the area.

- A bridge rail and approach replacement project on SR 330 began April 2 and is expected to be completed by summer 2020. Work will be at City Creek Bridge and East Fork City Bridge with only one lane open in either direction, with a temporary signal.

- A bridge rehabilitation project resumes on SR 38 on the Santa Ana River Bridge today. A one-way flagging control operation will be in the area and the project is expected to conclude by the end of April.

Tim Bowman & Rick Seward- Municipal Water District

- East Ramp is open and patrolling the West Ramp

Stephanie Thoth – Big Bear Chamber of Commerce

- Thanked Dawn Marschinke, Big Bear Fire, for all the Alerts that are passed onto Chamber members.
- Modern Professionals meeting tonight at Santana & Maverick Bar & Grill.
- "What is After High School" Middle and High School students should begin thinking about local employment opportunities, careers and college. Students are asked to attend "Be on Track" on April 15th to hear about work and careers, Big Bear college opportunities and training.

PRESENTER:

GREG ZEIGLER,

HAZARDOUS MATERIALS SPECIALIST

COUNTY FIRE HAZMAT DIVISION EMERGENCY RESPONSE TEAM

Greg reviewed where the hazardous materials specialist train. They train at the U.S. Army Dugway Proving Ground where they take a course on advanced chemical & biological integrated response course. They also train at the Nevada Test Site on radiation response.

Greg stated that they also train in advance environmental crimes investigations; as well as go through Cal EPA Inspector Academy and FBI sampling protocol training.

Hazardous materials specialist respond to fuel spills, mercury spills, meth lab cleanups, general chemical spills at CUPA permitted facilities. Other duties include: (1) Investigations that are criminal, civil, and Statewide cases. (2) Enforcement Actions i.e. warrants, AEO and DA i.e. criminal. They report to highway hazmat transportation incidents, railroad incidents, unknown chemical/biological incidents (white powder); boat sinking incidents; airplane fuel spills.

Greg went on to describe the various equipment and tools they use to identify hazmat situations. He addressed how Mercury vapor is dangerous to humans and explained how they have to clean mercury spills. They do have an Aerial Vehicle (UAV) drone, which they often use.

END

Paul Marconi asked for adjourning of meeting. Phil Mosley made a motion to adjourn and Dawn Marschinke second the motion and the motion carried. The meeting adjourned at 9:45 am.
The next MMA meeting will be Tuesday, June 11, 2019.

Yomar Cleary
MMA Secretary

Agency Attendance:

American Red Cross/CERT	Erin Fox & Tom Hyatt
Bear Valley Healthcare District	Michael Mursick,
Bear Valley Healthcare District	Joanne Merrill & Jacob Phillips
Big Bear Chamber of Commerce	Stephanie Thoth
Bear Valley Unified School District	Shelli Black
Big Bear Airport District	Jack Roberts
Big Bear Municipal Water District	Tim Bowman & Rick Seward
Bear Valley Electric	Paul Marconi
Big Bear Fire Department …….	Mike Maltby & Dawn Marschinke
Big Bear CERT	Eric Steel & Dede Hermon
Big Bear Valley COAD/VOAD	Yomar Cleary & Bill Treadwell
Cal Fire	Ron Janssen & Keith Bickford
Caltrans	Shane Massoud & Emily Leinen
City of Big Bear Lake	Phil Mosley
Mountain Transit	Steve Brouard
San Bernardino County Fire	Steve Tracy & Ryan Gardy
San Bernardino County Fire – OES	John Ferdon
San Bernardino Big Bear Sheriff Station	Capt Mitch Dattilo &Lt. Ryan Collins
Southwest Gas	Phillip Petteruto

Guests:

San Bernardino County Fire	John Demel & Jason Alexander

Agencies not in Attendance:

BBARWA	Dave Lawrence
Big Bear Visitor Bureau	Matt McCabe
Big Bear Valley Parks & Rec.	Lorie Judd
Big Bear City, CSD	Mary Reeves & Gavin Heilman
Big Bear Lake DWP	Sierra Orr
California Highway Patrol	Jim Helm
Civil Air Patrol	Alan Hay
San Bernardino County Roads	Jim Dibel
San Bernardino Health Preparedness & Response	Justin Hutton & Vanessa Morales
Southern California Edison	Juan M. Lopez
Thomas Gas	David Calhoun
U. S. Forest Service	Thad Chavez

BIG BEAR VALLEY
MOUNTAIN MUTUAL AID ASSOCIATION
P. O. Box 6627, Big Bear Lake, CA 92315

GENERAL MEETING AGENDA

DATE: **June 11, 2019**
TIME: **0900 Hours**
LOCATION: **Civil Air Patrol –East Mountain Incident Management Center**
100 W. Meadow Lane
Big Bear City, CA

Call to Order

Pledge of Allegiance

Self-Introductions – Agencies/Organizations Give Updates

Approval of April 9, 2019 Big Bear Valley MMA Minutes;

Treasurer's Report & Approval – Sierra Orr, Treasurer

Communications – none

PRESENTATION
ALEX TARDY – NOAA NATIONAL WEATHER SERVICE

Alex Tardy is the Warning Coordination Meteorologist in charge of outreach and partner coordination for NOAA National Weather Service office in San Diego.

Unfinished Business

- Phil Mosley will work on the Capital Improvement Plan for the building and give a report at the August MMA meeting; thereby, **we are postponing the payment of membership dues until after August.**

New Business

- Since the Friends of the Disaster Center have dissolved their association, MMA will have to sign a Facilities Use Agreement with the Fire District who took over the building. MMA board is working on the details as to what MMA will be responsible for in using the building for our meetings.

Adjournment

BIG BEAR VALLEY
MOUNTAIN MUTUAL AID ASSOCIATION
P. O. BOX 6627
Big Bear Lake, CA 92315
GENERAL MEETING
MINUTES

DATE: **Tuesday, June 11, 2019**
TIME: **0900 Hours**
LOCATION: **East Mountain Incident Management Center**

Call to Order

Paul Marconi, Bear Valley Electric, called the meeting to order at 9:03 a.m.

Flag Salute

Paul Marconi, lead the flag salute.

Approval of Minutes

The April 9, 2019 MMA meeting minutes were presented for approval Phil Mosley made a motion to approve and John Ferdon, second the motion. Approval of the minutes was unanimous.

Approval of the Treasurer's Report – Sierra Orr

Sierra Orr, Treasurer, the ending balance as of June 1, 2019 was $27,496.65. MMA is buying a laptop computer to use when we have presenters. The cost of the laptop is $1,061.93 includes tax and shipping costs.

Correspondence – None

Unfinished Business - Phil Mosley, Vice President of MMA, is working on the MMA Capital Improvement Plan for the building and will give a report at the august MMA meeting; **thereby we are postponing the payment of membership dues until after August.**

New Business – Phil Mosley – Since the Friends of the disaster Center have dissolved their association, Big Bear MMA will have to sign a Facilities Use Agreement with the Fire District who took over the building. MMA board is working on the details as to what MMA will be responsible for the use of the building for our five meetings.

Self-Introductions/ Open Forum

Paul Marconi, Bear Valley Electric –

- PUC proceeding with the approval of our application to build a Solar Project which is a combined effort between BBARWA and Bear Valley Electric. It will be an 8 Megawatts solar power.
- Per PUC guidelines, we are working on preventing sparks from our lines, working on a wild fire litigation plan project to reduce fire caused by our lines.
- Working on a five-year de-energizing plan when high winds come through Big Bear though there is low possibility of high winds in our valley.

Yomar Cleary, Big Bear Valley COAD & VOAD

- Stated that she is the Chair for the Big Bear Valley Community Organizations Active in Disaster; (COAD) as well as the Chair for the San Bernardino County Organizations Active in Disaster (VOAD). The responsibility of COAD and VOAD is to find local resources within San Bernardino County before a disaster and provide those resources during the Recovery of an event. They can only be activated by County OES or by a City Disaster manager.

Phil Mosley, City of Big Bear Lake –

- Submitted the Hazardous Mitigation Plan to FEMA for approval. This plan is good for five years.
- Will be retiring from the City of Big Bear Lake in February of 2020.
- Animal Control facility has been renewed for ten years and another two 10 years extensions.

Jacob Phillips– Bear Valley Health Care District

- Preparing for an ICEMA unannounced exercise to evacuate patients from the hospital within 90 minutes.

Alan Hays – Civil Air Patrol

- Preparing Security for the Air Show on July 6th
- Hank Peralez will also represent Civil Air Patrol at the MMA meetings.

Chris Higgins – Southwest Gas

- The two gas lines going in on North Shore Drive have been delayed until later this year.

Mary Reeves – CSD

- Remind everyone about Clean Up Days
- Water conservation restrictions in place
- New Electric sign in front of the CSD office---can be used for emergency announcements.

Mike Maltby – Assistant Fire Chief –

- Gearing up for fire season

Sierra Orr – Big Bear Department of Water and Power

- Preparing for the Garden Tour. Future Garden Tours will be on a bi-annual so the next one will be in 2021.
- **W**ork is in progress putting up poles by the Convention Center. To beautify the area a garden is being put in place using flash waster.
- A pipeline project is going in next week so Knickerbocker to Stone will be closed for two days.

Ron Janssen, Division Chief, Cal Fire Mountain Div. Department of Forestry and Fire Protection, San Bernardino Unit

- As of yesterday, Cal Fire is at its peak staffing.
- Supporting Forest Service

John Ferdon – SB County Fire – Office of Emergency Services

- Disaster Assistance and Disaster Relief was activated to help those in need
- SHOC exercise was June 6th – This is a super shelter to accommodation 60,000 people
- John Ferdon will be on duty for July 4. EOC will not be activated just monitoring.

Juan Lopez – Southern California Edison

- Working with Cal Fire on enhancing circuits
- Doing presentation in the Arrowhead Community on de-energizing circuits when necessary

Erin Fox – American Red Cross

- Sound the Alarm Project in Big Bear went very well. Installed 278 fire alarms and educated 81 residents. This project has already saved two people from fire.
- Thanked the Big Bear Fire District for providing the barbecue to cook hot dogs and hamburgers for the volunteers.
- Red Cross participated in the SHOC exercise training Red Cross volunteers on how to set up a shelter.

PRESENTER:

ALEX TARDY,

Alex Tardy is the Warning Coordination Meteorologist in charge of outreach and partner coordination for NOAA National Weather Service office in San Diego.

If you want to see his entire presentation on U-Tube, go to:

https://www.youtube.com/NWSSanDiego

And click on "2018-19 Climate – Extreme weather events and Outlook"

A recap of his presentation on Southern California climate review for 2018 was as follows:

- **Fuel moisture** (wildfire) near record low
- **Summer** (July-August) was record warm
- **Sea surface** temperatures reached record high in California
- **Summer** minimum temperature record warm
- **Summer humidity** much above normal
- **Monsoon** was average or below average
- **Drought w**orsen and expanded in So Cal
- **State and SoCa;** water supply was good

In Summary:

- 2018 -2019 Wet season was opposite extreme of 2017-2018, 2016-17, 2010-11 and 2004-05 125 to 175 percent of average.
- January and especially February 2019 were cold months (breaks streaks of years
- Cool Winter Months (December to February) and frequent precipitation has led to super bloom and significant green areas
- El Nino conditions developed in the fall of 2018 and the atmosphere river began responding in February 2019.
- Last time no D1 or higher (drought) in California was 2011
- Reservoirs in So California still re below average but statewide above average.
- Snowpack in California is much above average 160%
- Still early Spring storms expected despite late March/April warm and dry
- May was very wet and record cold in Southern California Mountains.
- 2019 Summer will be hotter than normal.

END OF PRESENTATION

Paul Marconi asked for adjourning of meeting. Phil Mosley made a motion to adjourn and Alan Hay second the motion and the motion carried. The meeting adjourned at 10:15 am.
The next MMA meeting will be Tuesday, August 13, 2019.

Yomar Cleary
MMA Secretary

Agency Attendance:

American Red Cross/CERT	Erin Fox
Bear Valley Healthcare District	Jacob Phillips
Bear Valley Electric	Paul Marconi
Big Bear Fire Department …….	Mike Maltby
Big Bear Valley COAD/VOAD	Yomar Cleary
Big Bear City, CSD	Mary Reeves
Big Bear Lake DWP	Sierra Orr
Cal Fire	Ron Janssen
City of Big Bear Lake	Phil Mosley
Civil Air Patrol	Alan Hay
Mountain Transit	Steve Brouard
San Bernardino County Fire – OES	John Ferdon
Southwest Gas	Chris Higgins
Southern California Edison	Juan M. Lopez

Guests:

Agencies not in Attendance:

BARWA	Dave Lawrence
Big Big Bear CERT	Eric Steel & Dede Hermon
Big Bear Chamber of Commerce	
Big Bear Visitor Bureau	Matt McCabe
Big Bear Valley Parks & Rec.	Lorie Judd
Bear Valley Unified School District	Shelli Black
Big Bear Airport District	Jack Roberts
Big Bear Municipal Water District	Tim Bowman & Rick Seward
San Bernardino County Fire	Steve Tracy & Ryan Gardy
California Highway Patrol	Jim Helm
Caltrans	Shane Massoud & Emily Leinen
San Bernardino Big Bear Sheriff Station	Capt Mitch Dattilo &Lt. Ryan Collins
San Bernardino County Roads	Jim Dibel
San Bernardino Health Preparedness & Response	Ashley Flores, Marc Peren
Thomas Gas	David Calhoun
U. S. Forest Service	Thad Chavez

BIG BEAR VALLEY
MOUNTAIN MUTUAL AID ASSOCIATION
P. O. Box 6627, Big Bear Lake, CA 92315

GENERAL MEETING AGENDA

DATE: **August 13, 2019**
TIME: **0900 Hours**
LOCATION: **Civil Air Patrol –East Mountain Incident Management Center**
100 W. Meadow Lane
Big Bear City, CA

Call to Order

Pledge of Allegiance

Self-Introductions – Agencies/Organizations Give Updates

Approval of June 11, 2019 Big Bear Valley MMA Minutes;

Treasurer's Report & Approval – Sierra Orr, Treasurer $26,434.72

Communications –

PRESENTATION

John Ferdon

San Bernardino County Fire OES

Tabletop Exercise Overview

Unfinished Business

Per Phil Mosley, Vice President: "As the MMAA does not have any rent or maintenance costs associated with the airport building (now owned by the Airport and leased by Big Bear Fire Authority), I believe that MMAA annual operating costs are well below $1000. Predicated on this information and the current fund balance of the MMAA's bank account, I recommend that we propose annual member dues to be lowered to $25 with a waiver of payment of annual member dues this year." Motion to approve.

New Business None

- Registered MMAA with the Great California Shake-Out. -
- October 8th will be the last Mountain Mutual Aid meeting of the year until February 11, 2020.

Adjournment

BIG BEAR VALLEY
MOUNTAIN MUTUAL AID ASSOCIATION
P. O. BOX 6627
Big Bear Lake, CA 92315
GENERAL MEETING
MINUTES

DATE: **Tuesday, August 13, 2019**
TIME: **0900 Hours**

LOCATION: **East Mountain Incident Management Center**

Call to Order

Phil Mosley, Vice President, called the meeting to order at 9:03 a.m.

Flag Salute

Phil Mosley lead the flag salute.

Approval of Minutes

The June 11, 2019 MMA meeting minutes were presented for approval Phil Mosley made a motion not to approve minutes because Paul Marconi, President and Sierra Orr, Treasurer were not present. They will be presented at the October 8, 2019 MMA meeting.

Approval of the Treasurer's Report – Sierra Orr

Sierra Orr, Treasurer, was unavailable but submitted the treasurer's report showing the ending balance as of August 12, 2019 was $26,434.72.

Correspondence – None

Unfinished Business - Phil Mosley, Vice President of MMA, As the MMAA does not have any rent or maintenance costs associated with the airport building (now owned by the Airport and leased by Big Bear Fire Authority), I believe that MMAA annual operating costs are well below $1000. Predicated on this information and the current fund balance of the MMAA's bank account, we propose annual member dues to be lowered to $25 with a waiver of payment of annual member dues this year.

New Business – Phil Mosley – MMA

- Mountain Mutual Aid is registered with the California Great Shake-Out scheduled for October 17, 2019 at 10:17 am.
- Election of new MMA officers is scheduled for the October 8th. Two vacancies: MMA
- Secretary and Vice President. Phil Mosley announced he is retiring the end of January 2020. He asked for nomination be submitted to Yomar before the October meeting.
- Phil announced that the San Bernardino County Board of Supervisors is recognizing Yomar Cleary on Wednesday, August 14 as a "Safety Hero" for her involvement in the Big Bear Valley Community Organizations Active in Disaster (COAD) and for being Chair of the San Bernardino County VOAD.
- Highway 330 will be closed from September 9th thru September 20th – Cal Trans doing slope maintenance. Both the Sheriff's Department and the CHP have agreed that should we have evacuation orders, that the down bound lanes will be open for evacuation

Self-Introductions/ Open Forum

Yomar Cleary, Big Bear Valley COAD & VOAD

- Asked that everyone check the Confidential Roster to make sure the information for their agency is correct and if not to please add any corrections. Needed are cell phone numbers should a disaster event happen during after business hours or weekends, the office numbers do not work.
- She mentioned that the MMA Resource List was sent out a few months ago and some of the agencies have not updated their information. She will again send out a request to update the resource list. This is needed so if disaster hits Big Bear Valley, we know who to contact for a particular resource.

Phil Mosley, City of Big Bear Lake –

- City is working on heating the sidewalks at City Hall for safety reasons during winter snow.
- Winding down summer operations
- Getting ready for winter operations

John Ferdon, San Bernardino County Fire OES

- Announced that the Small Business Administration has activated to help with the Trona earthquake financial assistance.

Jacob Phillips– Bear Valley Health Care District

- Preparing for an ICEMA unannounced exercise to evacuate patients from the hospital within 90 minutes.
- Bear Valley Heath Care District will participate in the California Shake Out

Phillip Petteruto – Southwest Gas

- The two gas lines going in on North Shore Drive are delayed until later this year.
- Before digging make sure you call 8-1-1 to make sure there are no gas lines

Mary Reeves – CSD

- Water Services CAP Project is going to bid
- Moved the fencing to make room for trash storage
- Going to semi-auto collections

Dawn Marschinke – Big Bear Fire Authority

- Has been a quiet summer – no fires
- The sirens installed some time ago, will go off starting August 22 at 11 am and every 4th Thursday of the month They will go off in preparation to alert the residents of an impending evacuation, fire or? If you hear, the sirens go 3 minutes straight, turn on your local radio station to find out the reason for the alert. Don't call 911.
- If approved there will be a tax measure in the March elections ballot

Jack Roberts & Ryan Goss – Big Bear Airport District

- Air Fair held recently with no incidents. Due to the holiday weekend, had more people than normal.
- The Airport has 170 acres which is a lot of weed abatement
- Due to the February snow storms, there were several hangers that were damaged

Brett Taylor – Cal Fire

- Division Chief Ron Janssen is moving.
- Hired an additional Battalion Chief Arnold Ramirez
- Hired 8 additional CalFire staff

Kevin - Did not sign in have no information on him

Steve Brouard – Mountain Transit

- Preparing for October Fest setting up shuttles
-

PRESENTER: JOHN FERDON

San Bernardino County Fire Office of Emergency Services

John Ferdon addressed what is the California Shake-Out is all about. It's to promote communitywide earthquake readiness. Shake-Out provides agencies with the opportunity to evaluate emergency plans. Increase awareness of earthquake safety among employees and improve resiliency within their community.

John referred to the 4th of July earthquake in Trona, they had no power, no water and no communications relate this to the Big Bear community. Is Big Bear prepared? Shake Out drill can be as simple as Drop, Cover and Hold On drill. Or you can do a Life Safety Drill is to engage employees

to think through their emergency response actions during an earthquake, then afterwards review and discuss what worked or what did not in order to make improvements for the next drill or actual earthquake.

John went on to say that, there are many resources available by going to www.ShakeOut.org the website can help you plan your Shake Out activities. He encouraged everyone to register their participation. He went on to provide some FEMA Independent Study Online training:

- IS-120. (c) Introduction to
  - IS-130(a) How to be an Exercise
  - IS-139 (a) Exercise Design and
  - FEMA EMI or Online
    - E/K0146 Homeland Security Exercise and Evaluation Program (HSEEP) Training course.

He also encouraged everyone to call the Office of Emergency Services and they too can provide information on Shake Out exercises.

END OF PRESENTATION

Phil Mosley asked for adjourning of meeting. Brett Minor and made a motion to adjourn and second John Ferdon the motion and the motion carried. The meeting adjourned at 9:45 am.
The next MMA meeting will be Tuesday, October 8, 2019.

Yomar Cleary
MMA Secretary

Agency Attendance:

Bear Valley Healthcare District	Jacob Phillips
Big Bear Fire Department …….	M.Maltby, D. Marschinke & N.Bruinsma
Big Bear Valley COAD/VOAD	Yomar Cleary
Big Bear City, CSD	Mary Reeves & Gavin Heilman
Cal Fire	Brett Taylor
Big Big Bear CERT	Eric Steele & Dede Hermon
Bear Valley Unified School District	Syd Callaway
Big Bear Airport District	Jack Roberts & Ryan Goss
City of Big Bear Lake	Phil Mosley
Mountain Disaster Radio Network	Brett Minor
Mountain Transit	Steve Brouard
San Bernardino County Fire – OES	John Ferdon
Southwest Gas	Phillip Petteruto

Guests:

Agencies not in Attendance:

American Red Cross/CERT	Erin Fox
Bear Valley Electric	Paul Marconi
BBARWA	Dave Lawrence
Big Bear Lake DWP	Sierra Orr
Big Bear Chamber of Commerce	Ellen Clarke
Big Bear Visitor Bureau	Matt McCabe
Big Bear Valley Parks & Rec.	Lorie Judd
Big Bear Municipal Water District	Tim Bowman & Rick Seward
Civil Air Patrol	Alan Hay
San Bernardino County Fire	Steve Tracy & Ryan Gardy
California Highway Patrol	Jim Helm
Caltrans	Shane Massoud & Emily Leinen
San Bernardino Big Bear Sheriff Station	Capt Mitch Dattilo &Lt. Ryan Collins
San Bernardino County Roads	Jim Dibel
San Bernardino Health Preparedness & Response	Ashley Flores, Marc Peren
Southern California Edison	Juan M. Lopez
Thomas Gas	David Calhoun
U. S. Forest Service	Thad Chavez

BIG BEAR VALLEY
MOUNTAIN MUTUAL AID ASSOCIATION
P. O. Box 6627, Big Bear Lake, CA 92315

GENERAL MEETING AGENDA

DATE: **October 8, 2019**
TIME: **0900 Hours**
LOCATION: **Civil Air Patrol –East Mountain Incident Management Center**
100 W. Meadow Lane
Big Bear City, CA

Call to Order

Pledge of Allegiance

Self-Introductions – Agencies/Organizations Give Updates

Approval of April 9th & August 13, 2019 Big Bear Valley MMA Minutes;

Treasurer's Report & Approval – Sierra Orr, Treasurer $26,328.72

Communications –

PRESENTATION: THE GREAT CALIFORNIA SHAKEOUT

Sierra Orr: Introductory Discussion –

Each Agency asked to summarize in 2 minutes their agency's plan for what they are doing for the Great California Shake Out (if applicable) and what plans their Agency have for an actual earthquake response. Distribution of handout listing Resources.

Yomar Cleary – San Bernardino County Voluntary Organizations Active in Disaster (SBC VOAD) Trona Response Presentation.

Unfinished Business

- Approval of 2020 Dues to be reduced to $25.00 per agency. Friends of the Disaster Center (FODC) has been dissolved so MMA no longer has to support FODC by making upgrades to the building.
- CSD, Fire Authority, City of Big Bear Lake Hazard Mitigation Plan Update
- Registered MMA with the Great California Shake Out. -
- October 8th will be the last Mountain Mutual Aid meeting of the year until February 11, 2020.

New Business None

- Nominations and elections of MMA Vice President (Phil Mosley retiring from the City of Big Bear Lake in January 2020)
- Nominations and elections of MMA Secretary –

Adjournment

BIG BEAR VALLEY
MOUNTAIN MUTUAL AID ASSOCIATION
P. O. BOX 6627
Big Bear Lake, CA 92315

GENERAL MEETING
MINUTES

DATE: **Tuesday, October 8, 2019**
TIME: **0900 Hours**

LOCATION: **East Mountain Incident Management Center**

Call to Order

Phil Mosley, Vice President, called the meeting to order at 9:10 a.m.

Flag Salute

Jacob Phillips led the flag salute.

Approval of Minutes

The June 11, 2019 MMA meeting minutes were presented for approval Phil Mosley made a motion to approve. Sierra Orr made a motion to approve and Ryan Goss second the motion. The motion was approved. By the membership

Approval of the Treasurer's Report – Sierra Orr

Sierra Orr, Treasurer, was unavailable but submitted the treasurer's report showing the ending balance as of October 8, 2019 was $26,328.72. Mike Maltby made a motion to approve and Jacob Phillips seconded the motion. The motion was approved by the membership.

Correspondence – None

Unfinished Business - Phil Mosley, Vice President of MMA, announced that the MMA Bylaws will be revised to realign the duties of the officers and will be presented at the February 11, 2020 meeting for approval. The bylaws will be emailed to the membership prior to the meeting.

Phil Mosley informed the members present that the input they had provided in the review and update of the CSD, Fire Authority and City of Big Bear Lake was valuable and had been included

in the update. Vice President Mosley asked the membership if they had additional input. The only response was a request to include the February 14, 2019 flash flood event in the plan update.

Phil Mosley made a motion for approval by the membership to reduce the yearly MMA dues to $25.00 a year starting in July 2020. No dues to be collected for 2019. Mary Reeves, CSD made a motion to approve and seconded by Jacob Phillips.

New Business – Phil Mosley –

Elections of 2020 MMA Officers; Phil Mosley asked for nominations from the floor, hearing none he proceeded to present the slate of officers for approval:

- Paul Marconi, President……. Bear Valley Electric
- Mike Maltby, Vice President……Bear Valley Fire Authority
- Michael Mursick, Secretary……. Bear Valley Health Care District
- Sierra Orr, Treasurer……Department of Water & Power

All nominees were presented to the membership and were unimously approved.

Self-Introductions/ Open Forum

Phil Mosley, City of Big Bear Lake –
- Getting ready for winter operations
- Will be retiring January, 2020
- Looking forward to Halloween in the Village

Yomar Cleary, Big Bear Valley COAD & VOAD
- Stated that San Bernardino County VOAD has been working the Trona Earthquake

Sierra Orr – Department of Water and Power
- Installing a main water line
- Had problem with a water well but have resolved
- Lake Williams has three water wells that are working just fine

Jacob Phillips– Bear Valley Health Care District
- Recruiting staff for the winter
- Cross Training all employees to cover all work areas

Jacob Griede – California Highway Patrol
- New PIO for the CHP
- Getting ready for Winter
- Has been "car seat" trained –call office set up an appointment

Anthony Rapoza –S.B. County Fire – Mountain Division
- Announced that they now have a new boat out of Fawnskin Station and all the staff have been training to respond in the boat.

Dave Durst – Southwest Gas
- October is transition month in preparation for winter

Mary Reeves – CSD

- The semi-auto collections going good
- Doing maintenance of the reservoir

Mike Maltby – Big Bear Fire Authority

- Has been a quiet summer – no fires
- Gearing up for Winter
- Continuing with the Chipping Program

Ryan Goss – Big Bear Airport District

- Getting ready for Winter
- Working on the site plan for the Air Terminal
- Coordinating with the Public Health for their full deployment exercise

Trish Muth-Masayon – Public Health Preparedness and Response Program

- Announced that the Health Department is doing a full deployment at the Big Bear Airport as a training exercise. As part of their exercise, they will be offering free flu shots to the Big Bear residents. The date is October 16 from 2:00 pm until 4:00 pm.

Eric Steele – Big Bear CERT Program

- CERT members ready to help during disasters

PRESENTERS: Sierra Orr and Yomar Cleary

Sierra Orr - California Shake Out Review – She conducted a series of questions on how prepare is each of the agencies/organizations for a disaster in Big Bear. She asked if they had a disaster plan in place and did they know where the plan was located. Could they access it within five minutes? She asked several other questions on how prepare they were. Most answered affirmative. She had handouts to help develop their preparedness.

Yomar Cleary – Reviewed a Power Point on what San Bernardino County Voluntary Organizations Active in Disaster or VOAD does. Reviewed how the earthquake in Trona affected the residents and how VOAD responded in assisting the residents with unmet needs. Showed a short video on how the Trona earthquake damaged homes, the highway and businesses.

Phil Mosley was presented with a Retirement Card inside with a gift certificate for BJ's restaurant and a Golf Gift Card. Yomar thanked him for his many years with MMA both as President and Vice president. Wished him the best.

Phil Mosley asked for adjourning of meeting. Sierra Orr made a motion to adjourn and second Jacob Phillips the motion and the motion carried. The meeting adjourned at 10:20 am.
The next MMA meeting will be Tuesday, February 11, 2020.

Yomar Cleary

Yomar Cleary MMA Secretary

Agency Attendance:

American Red Cross/CERT	Erin Fox
Bear Valley Healthcare District	Jacob Phillips
Big Bear Fire Department …	Mike Maltby,
Big Bear Lake DWP	Sierra Orr
Big Bear Valley COAD/VOAD	Yomar Cleary & Bill Treadwell
Big Bear City, CSD	Mary Reeves
Big Big Bear CERT	Eric Steele
Big Bear Airport District	Ryan Goss
California Highway Patrol	Jacob Griede
City of Big Bear Lake	Phil Mosley
Southwest Gas	Dave Durst & guest
San Bernardino Health Preparedness & Response	Trish Muth-Masayon
San Bernardino County Fire	Anthony Rapoza

Guests:

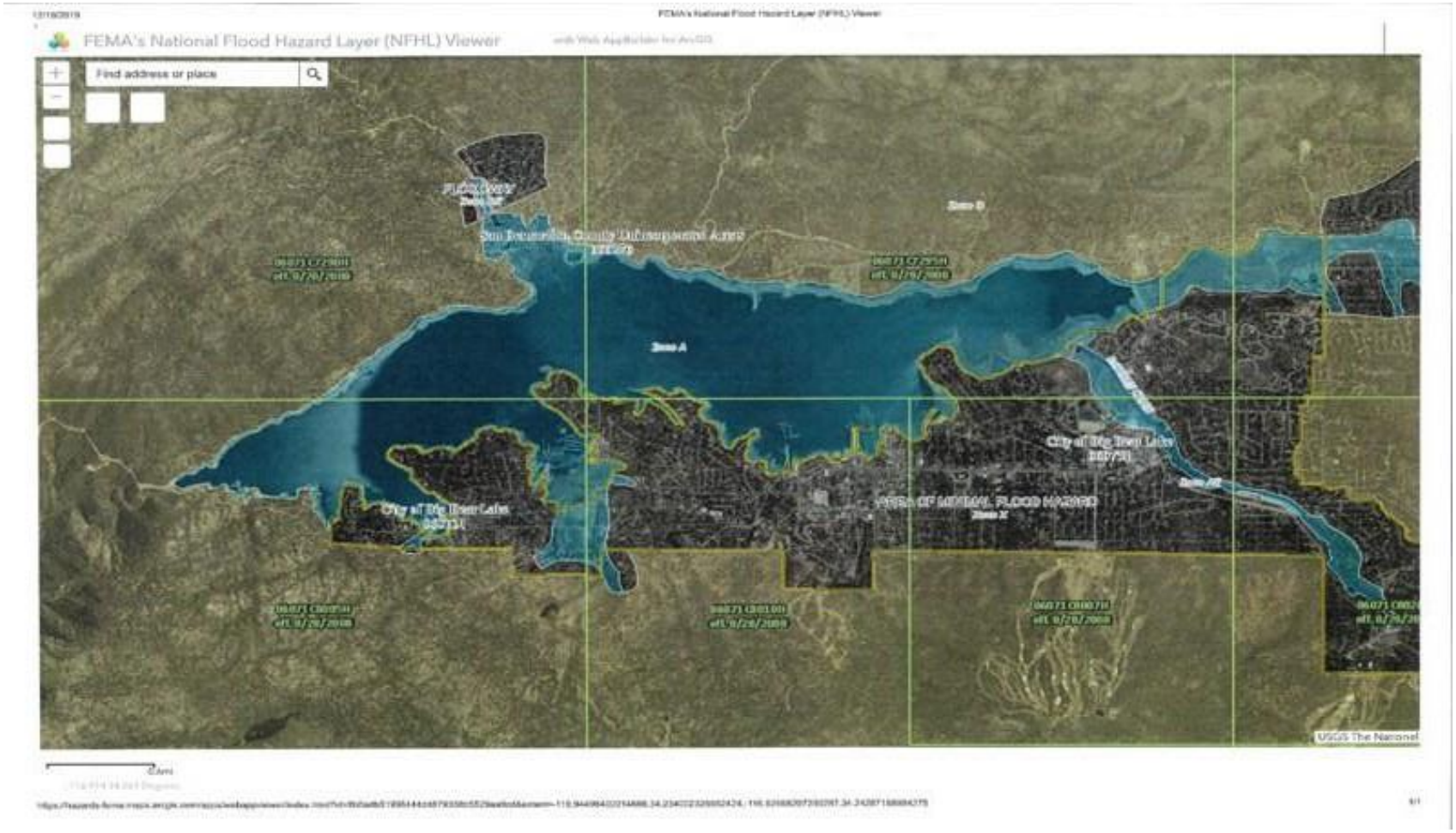
Agencies not in Attendance:

BBARWA	Dave Lawrence
Bear Valley Unified School District	Syd Callaway
Bear Valley Electric	Paul Marconi
Big Bear Chamber of Commerce	Ellen Clarke
Big Bear Visitor Bureau	Matt McCabe
Big Bear Valley Parks & Rec.	Lorie Judd
Big Bear Municipal Water District	Tim Bowman & Rick Seward
Cal Fire	Brett Taylor
Civil Air Patrol	Alan Hay
California Highway Patrol	Jim Helm
Caltrans	Shane Massoud & Emily Leinen
Mountain Disaster Radio Network	Brett Minor
Mountain Transit	Steve Brouard
San Bernardino County Fire – OES	John Ferdon
San Bernardino Big Bear Sheriff Station	Capt Mitch Dattilo &Lt. Ryan Collins
San Bernardino County Roads	Jim Dibel
Southern California Edison	Juan M. Lopez
Thomas Gas	David Calhoun
U. S. Forest Service	Thad Chavez

APPENDIX I

[ON FOLLOWING PAGE]

FEMA's National Flood Hazard Layer (NFHL) Viewer


FEMA's National Flood Hazard Layer (NFHL) Viewer
Find address or place
Zone D
Zone A
Zone AE
Zone X
AREA OF MINIMAL FLOOD HAZARD
USGS The National

APPENDIX J

[BEAR VALLEY DAM EMERGENCY ACTION PLAN ON FOLLOWING PAGE]

BIG BEAR MUNICIPAL WATER DISTRICT

EMERGENCY ACTION PLAN (EAP)

Bear Valley Dam
No. 803; NID No. CA00757

Big Bear Lake
San Bernardino County, California

With assistance from the
Association of Dam Safety Officials and the
California State Division of Safety of Dams

Reviewed and Updated:

Mike Stephenson
General Manager, Big Bear Municipal Water District

Date

Mitch Dattilo
Sheriff, San Bernardino County

Date

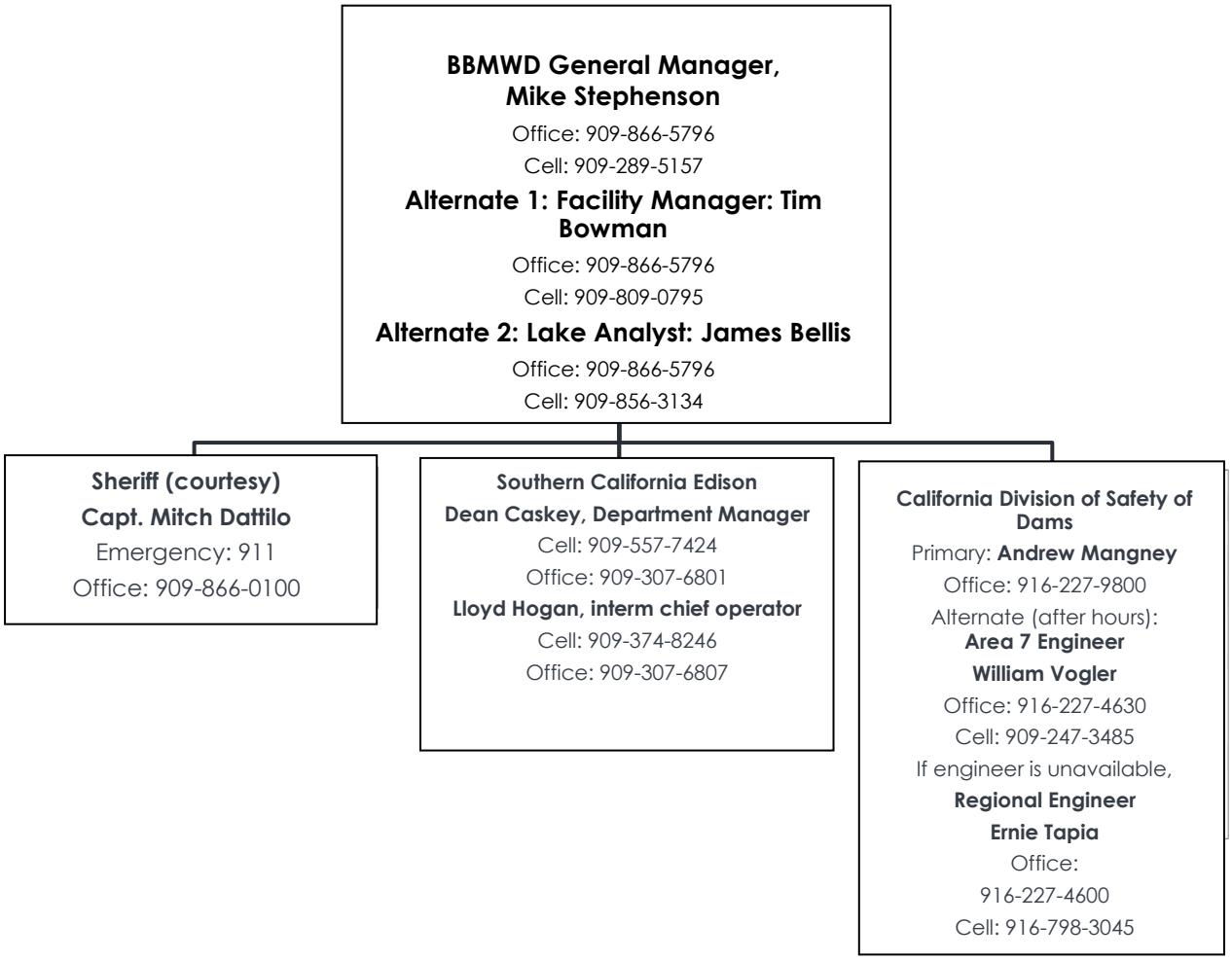
ABBREVIATIONS

ACE, USACE AOCE	United State Army Corps of Engineers
Big Bear Fire	Big Bear Lake Fire Protection District
BBMWD	Big Bear Municipal Water District
CalFire	California Department of Forestry
CalTrans	California Department of Transportation
CHP	California Highway Patrol
DSOD	California Division of Safety of Dams
EAP	Emergency Action Plan
Edison	Southern California Edison Company
OES	Office of Emergency Services
SARWQCB	Santa Ana Regional Water Quality Control Board
SBVWCD	San Bernardino Valley Water Conservation District
USFS	United State Forest Service
USBR	United States Bureau of Reclamation

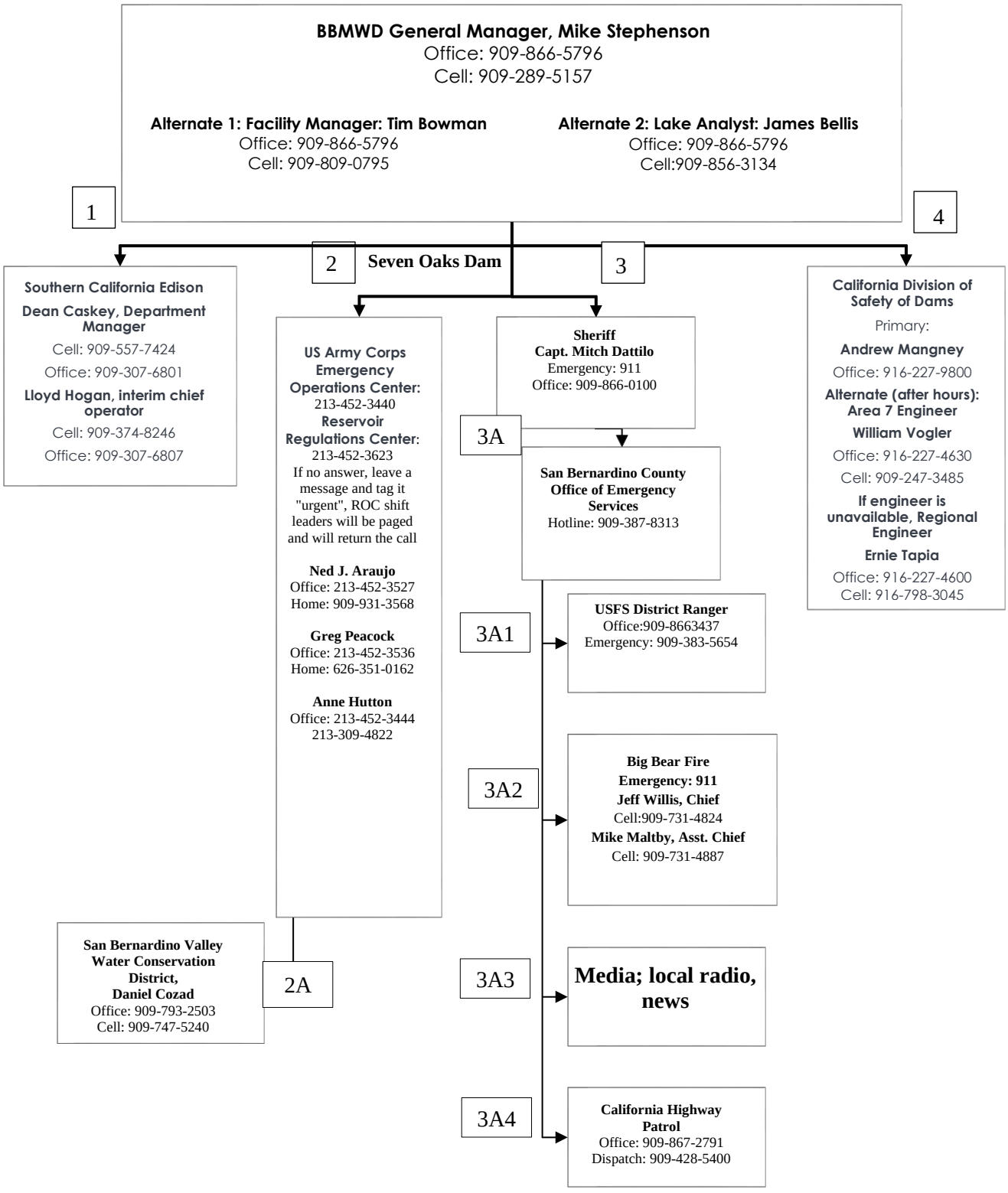
Contents

QUICK REFERENCE EMERGENCY CONTACTS

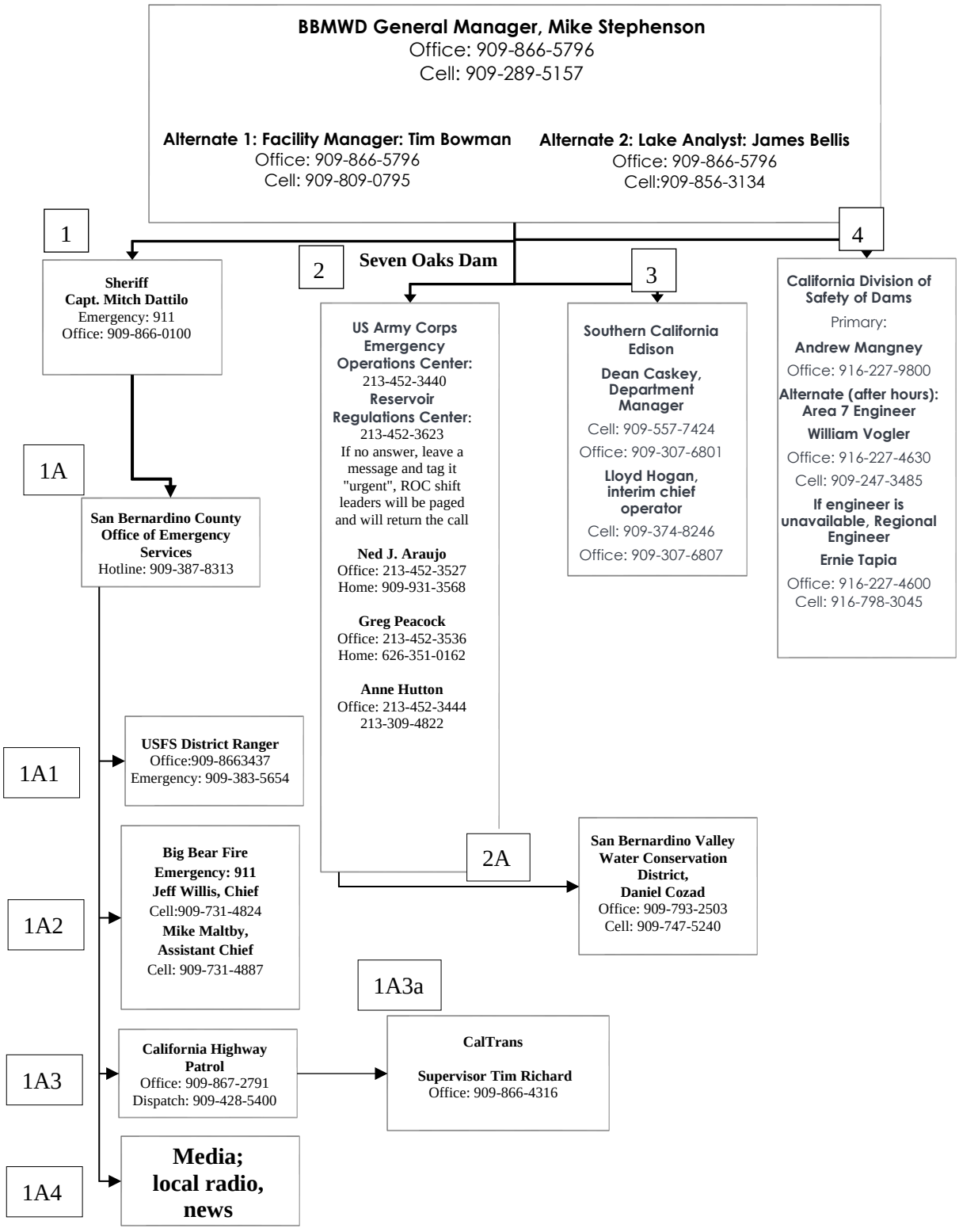
Emergency Level 1 Notification Flow Chart



Emergency Level 14 Notification Flow



Emergency Level 15 Notification Flow



Emergency Services Contacts

Agency/ Organization	*Full Name*	*Primary Contact*	*Address*	*Office Phone*	*Cell Phone*	*Emergency /Other Phone*
Big Bear Fire	Big Bear Fire Authority	Jeff Willis, Chief			909-731-4824	9-1-1
		Mike Maltby, Assistant Chief			909-731-4887	
BBMWD	Big Bear Municipal Water District	Mike Stephenson, General Manager	PO Box 2863, Big Bear Lake, CA 92315	909-866-5796	909-289-5157	
		Alternate: James Bellis, Lake Analyst			909-856-3134	
		Alternate: Tim Bowman, Facility Manager			909-809-0795	
California DSOD	California Division of Safety of Dams	Andrew Mangney	PO Box 942836 Sacramento, CA 95818	916-227-9800		
		Alternate: William Vogler		916-227-4630	916-247-3485	
		Alternate: Ernie Tapia		916-227-4630	916-798-3045	
Cal OES	California Office of Emergency Services	California Warning Center				916-845-8911
CHP	California Highway Patrol		31230 Highway 18, Running Springs, CA 92382	909-867-2791		909-428-5400
CalTrans	California Department of Transportation	Tim Richard, Supervisor		909-866-4316		
Sheriff	San Bernardino County Sheriff	Mitch Dattilo, Captain	PO Box 2803 Big Bear Lake, California 92315	909-866-0100		9-1-1
County OES	San Bernardino County Office of Emergency Services	Duty Officer	1743 Miro Way, Rialto, CA 92376	909-356-3998		909-387-8313/ 909-356-3911
SBVWCD	San Bernardino Valley Water Conservation District	Daniel Cozad	1630 West Redlands Boulevard, Redlands, CA 92373	909-793-2503	909-747-5240	
Edison	Southern California Edison	Dean Caskey, Department Manager	7865 Santa Ana Canyon Rd. Highland, CA 92346	909-307-6801	909-557-7424	
		Lloyd Hogan, Interim Chief Operator		909-307-6807	909-374-8246	
USFS Ranger	United States Forest Service	District Ranger, Mark Stamer	PO BOX 290, Fawnskin, CA 92333	909-866-3437		909-383-5654
Seven Oaks Dam, Army Corps	United States Army Corps of Engineers, Seven Oaks Dam	Emergency Operations Center				213-452-3440
		Reservoir Regulations Center				213-452-3623
		Ned J. Araujo		213-452-3527		Home: 909-931-3568
		Greg Peacock		213-452-3536		Home: 626-351-0162
		Anne Hutton		213-452-3444		Cell: 213-309-4822

DIVISION OF SAFETY OF DAMS CONTACT INFORMATION

For Questions, Contact the **Respective Area Engineer**

Northern Region	(916)565-7813
Regional Engineer Russell C. Bowlus	(916)565-7814
Area 1: Lakhblr Singh	(916)565-7815
Area 2: John Tatyosian	(916)565-7816
Area 3: Robert Curry	
Central Region	(916)565-7820
Regional Engineer: Melissa S. Collord	(916)565-7821
Area 4: Timothy Jimenez	(916)565-7822
Area 5: Austin C. Roundtree	(916)565-7823
Area 6: Param P. Dhillon	
Southern Region	(916)565-7827
Acting Regional Engineer: Ernie Tapia	(916)565-7828
Area 8: Brandon Cruz	(916) 565-7829
Area 9: Richard G. Draeger	(916) 565-7830

For Other General Inquiries Contact the Office Engineer:
Eric J. Holland (916)565-7811

FOR EMERGENCIES

CALL 911 IMMEDIATELY and
During normal business hours, call:
Andrew J. Mangney, Chief
Field Engineering Branch
(916) 565-7800

After hours, contact the Area Engineer or the Regional Engineer listed on the Dam Emergency Procedures Notice.
If the Division of Safety of Dams cannot be reached, call the

CalOES State Warning Center at:
(916) 845-8911

2. BASIC EAP DATA

1.1 PURPOSE

The purpose of this EAP is to reduce the risk of human life loss and injury and minimize property damage during an unusual or emergency event at Bear Valley Dam, around Big Bear Lake and downstream in the Santa Ana River Watershed.

1.2 POTENTIAL IMPACTED AREA

See Inundation Map (Appendix C) for the locations and contact information of the following residents and businesses that may be flooded if the dam should fail and the estimated time for the flood-wave to travel from the dam to these locations:

- Edison Power Facility at Bear Creek/ Santa Ana River convergence
- Seven Oaks Reservoir
- Recreational activities in Bear Creek and Santa Ana River

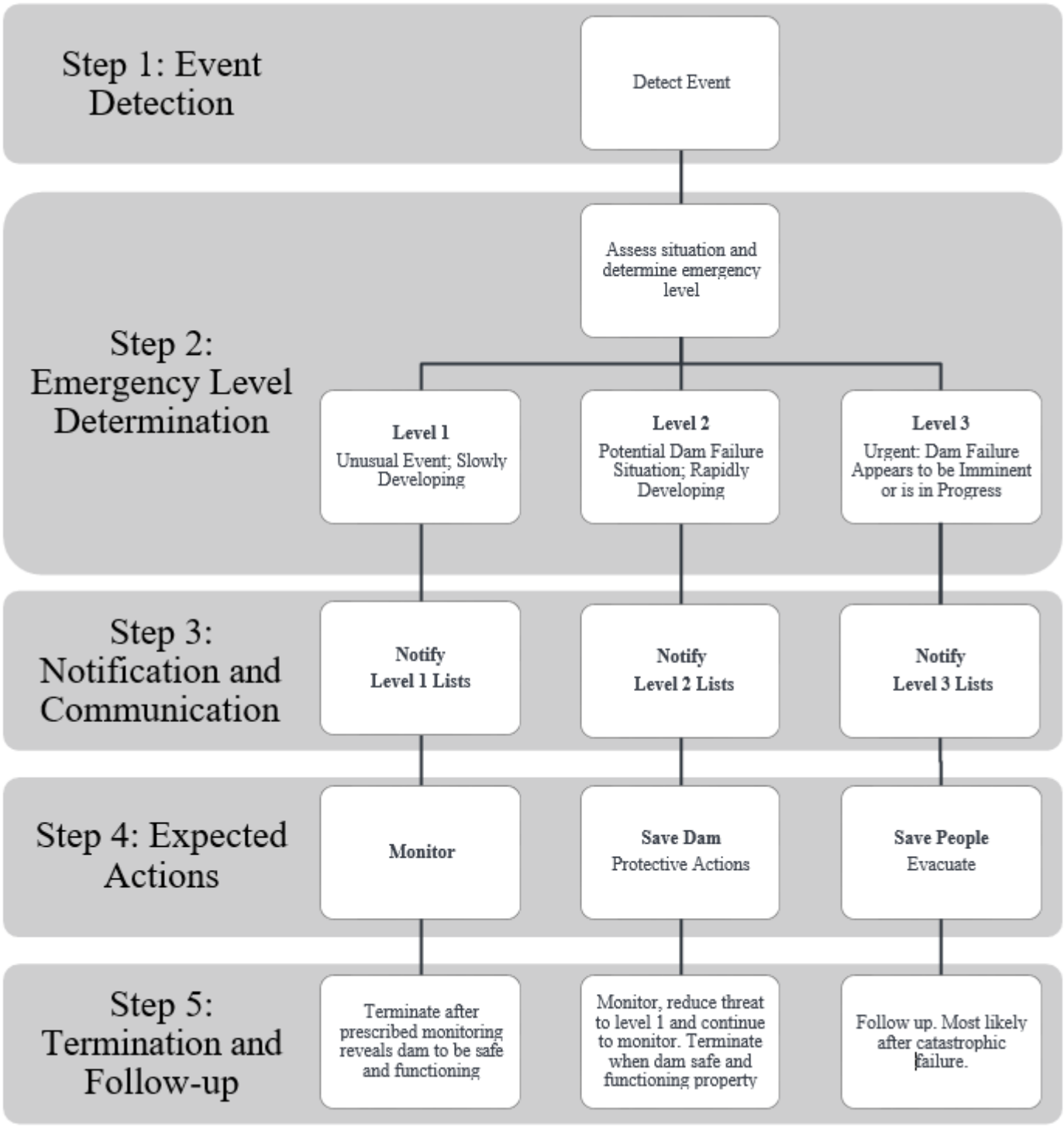
1.3 DAM DESCRIPTION

Location of Dam: SW Section 22, Township 2N, Range 1W, San Bernardino Base and Meridian
Latitude: 34.242273; Longitude: -116.977110
Route to Dam: Approximately 4 miles west of the Town of Big Bear Lake via State Highway 18, or approximately 24 miles east of the intersection of State Highways 18 and 330.

Height: 91 feet
Built: 1912
Hazard Classification: High
Type of Structure: Concrete Multiple Arch. Ten arches (bays) ranging in height from 15’ to 91’ founded on a foundation of sound crystalline rock. Total crest length is 360’ feet. Bays have been filled with mass concrete to form a virtual gravity dam with an upstream slope of 0.75:1 and a vertical downstream face from the crest to elevation 6,691.0’ below which the face slopes 0.25:1. The downstream side of the dam is further stabilized by eleven 1.5’ to 5.0’ wide buttresses located between each bay. Additional steel ties and reinforcements have been added to the buttresses for maximum stabilization. See detailed design in Appendix B.5

Normal Maximum Water Elevation: 6,743.2’
Storage Volume: 73,320 acre feet
Lake Surface Area: 2,973 acres
Watershed Drainage Area: 37 square miles
Secondary Flood Control Structures: Seven Oaks Dam, 9 miles downstream
Dam Operator: BBMWD
Major Property Owner: USFS
National Inventory of Dams No.: CA 00757
Dam Designer: R.W. Beck and Associates

2. EAP OVERVIEW – FIVE STEP PROCESS



3. ROLES AND RESPONSIBILITIES

3.1 DAM OWNER'S REPRESENTATIVE (PRIMARY: GENERAL MANAGER; ALTERNATE: LAKE ANALYST, FACILITY MANAGER)

- As soon as an emergency event is observed or reported, immediately determine the emergency level (see *emergency level* tab)
  - Level 1: Unusual event, slowly developing
  - Level 2: Potential dam failure situation, rapidly developing
  - Level 3: Dam failure appears imminent or is in progress
- Immediately notify the personnel in the order shown on the notification chart for the appropriate level (see *notification charts* tab)
- Provide updates of the situation to the sheriff dispatcher to assist them in making timely and accurate decisions regarding warnings and evacuations.
- Provide leadership to assure the EAP is reviewed/updated annually and copies of the revised EAP are distributed to all who received copies of the original EAP.

3.2 INCIDENT COMMANDER (COUNTY SHERIFF)

- Serves as the primary contact person responsible for coordination of all emergency actions.
- When a Level 2 situation occurs: Initiate and set up Emergency Operations Center (EOC). EOC space is available at the Big Bear Municipal Water District Board Room if necessary. Prepare emergency management personnel for possible evacuation that may be needed if a Level 3 situation occurs.
- When a Level 3 situation occurs:
  - Initiate warnings and order evacuation of people at risk on the lake and downstream of the dam.
  - Notify the San Bernardino County Office of Emergency Services to carry out the evacuation of people and notify US Forest Service to close roads leading to Bear Canyon and down stream areas.
- When threat is greatly diminished and dam is considered safe by the Dam Owner and the California State Division of Safety of Dams, BBMWD and Sheriff decide when to terminate the emergency.
- Participate in an annual review and update of the EAP.

3.3 SAN BERNARDINO COUNTY OFFICE OF EMERGENCY SERVICES

- Maintain communication with the media.
- When a Level 2 situation occurs:
  - Prepare emergency management personnel for possible evacuations that may be needed if a Level 3 situation occurs.
  - Alert the public.
- When a Level 3 situation occurs:
  - Alert the public
  - Immediately close roads, evacuate people on the lake, and within the inundation area (see *inundation map* tab)
- Participate in annual review and update of the EAP

3.4 California State Division of Safety of Dams

- Advise the Dam Owner of the emergency level determination, if time permits.
- Advise the Dam Owner of remedial actions to take if a Level 2 event occurs, if time permits.

4. EVENT DETECTION – STEP1

This step describes the detection of an unusual or emergency event and provides information to assist the Dam Owner in determining the appropriate emergency level for the event.

Unusual or emergency events may be detected by:

- Observations at or near the dam by BBMWD personnel, government personnel (local, state, or Federal), landowners, visitors, or the public.
- Evaluation of instrumentation and flow data by the dam keeper
- Earthquakes felt or reported in the vicinity of the dam (usually over 3.0 on the Richter Scale)
- Forewarning of conditions that may cause an unusual event or emergency event at the dam (for example, a severe weather or flash flood forecast)

See *Guidance for Determining the Emergency Level* table for assistance in evaluating specific events to determine if they are unusual or potential emergency situations.

5. EMERGENCY LEVEL DETERMINATION – STEP 2

After an unusual or emergency event is detected or reported, the General Manager or his alternate is responsible for classifying the event into one of the following three emergency levels:

5.1 Emergency Level 1–Nonemergency, unusual event, slowly developing

This situation is not normal but has not yet threatened the operation or structural integrity of the dam but possibly could if it continues to develop. State Dam Safety Officials should be contacted to investigate the situation and recommend actions to be taken. The condition of the dam should be closely monitored, especially during storm events, to detect any development of a potential or imminent dam failure situation. The Sheriff should be informed if it is determined that the conditions may possibly develop to a worse condition that may require emergency actions.

BBMWD dam personnel shall monitor the dam as prescribed by the General Manager. Periodic updates shall be given to the sheriff by the BBMWD General Manager.

5.2 Emergency Level 2 – Potential dam failure situation, rapidly developing

This situation may eventually lead to dam failure and flash flooding downstream, but there is not an immediate threat of dam failure. This situation may contain observed vandalism or potential terrorist acts to the dam structure or outlet works. The sheriff should be notified of this emergency situation and placed on alert. The General Manager or alternate should closely monitor the condition of the dam and regularly report the status of the situation to the Sheriff.

BBMWD Lake Patrol shall clear the lake of swimmers and boaters. If the dam condition worsens and failure becomes imminent, the sheriff must be notified immediately of the change in the emergency level and begin to evacuate the people at risk downstream.

If time permits, state dam safety officials should be contacted to evaluate the situation and recommend remedial actions to prevent failure of the dam. The General Manager should initiate remedial repairs (*Emergency Repairs Memorandum of Understanding* - see Appendix B-1). Through the Emergency Repairs MOU, the BBMWD General Manager has the direct authority to initiate emergency repairs with local contractors who have agreed to the MOU.

This emergency level is also applicable when heavy flows though the dam's concrete service spillways are expected. Spillway flow may result in flooding of downstream areas. Heavy flooding may result in inundation of properties around the lake's edge.

5.3 EMERGENCY LEVEL 3 – URGENT; DAM FAILURE APPEARS IMMINENT OR IS IN PROGRESS This is an extremely urgent situation when a dam failure is occurring or obviously is about to occur and cannot be prevented. Flash flooding will occur downstream of the dam. This situation is also applicable when flow through the outlet works, service spillway, and emergency spillways is causing downstream flooding of people, property, and roads. Combined flooding from Big Bear Lake and Bear Creek with the Santa Ana River may harm the structural integrity of Seven Oaks Dam. In a catastrophic flood event (500-year flood) or combined natural disasters where the Seven Oaks Dam may be damaged, the BBMWD shall be promptly notified of any problems with the Seven Oaks Dam. The Sheriff should be contacted immediately so emergency services can begin evacuations of all at-risk people and close roads as needed (see *Inundation Map* tab).

See the flowing pages for guidance in determining the proper emergency level for various situations.

5.4 GUIDANCE FOR DETERMINING EMERGENCY LEVEL

Table 1: Detection and Emergency Level Priority

EVENT	SITUATION	EMERGENCY LEVEL
Spillway Flow	Reservoir water surface elevation at emergency spillway crest and/or is flowing through service with no active erosion	1
	Spillway flowing with active erosion at embankments	2
	Spillway flowing which could result in flooding of people downstream if the reservoir level continues to rise	2
	Damage to Seven Oaks Dam with Big Bear Lake's spillway flowing at full capacity (500-year flood event)	3
	Lake level rising rapidly, spillway cannot handle total release and properties around lakes edge are about to flood (500-year flood event)	3 *dam failure not imminent
Dam crest overtopping	Reservoir level is one (1) foot below the top crest of the dam and rising	2
	Water from the reservoir is flowing over the top of the dam	2
Seepage	New seepage areas in or near the dam	1
	New seepage areas with cloudy discharge or increasing flow rate	2

EVENT	SITUATION	EMERGENCY LEVEL
	Seepage with discharge greater than 10 gallons per minute (GPM)	3
	High seepage (>10GPM) from groundwater/pressure release pipes	
Sinkholes	Observation of new sinkhole in reservoir area or on embankment	2
	Rapidly enlarging sinkhole	3
Embankment cracking	New cracks in the embankment greater than ¼ inch wide without seepage	1
	Cracks in the embankment with seepage < 10 GPM	2
	Cracks in the embankment with seepage >10 GPM	3
Embankment movement	Visual movement/creep/slippage of the embankment slope	2
	Sudden or rapidly proceeding movement of the embankment slopes	3
Instruments	Medium to high flow rate (>3 cfs) at Weir #1 on sunny day (no snow melt)	3
	High flow rate (>12 cfs) at Weir #1 on a rainy/snowy day	3
	Medium flow rate (2-3 cfs) at Weir #1 on a sunny day	2
Earthquake	Measureable earthquake felt or reported on or within 50 miles of the dam	1
	Earthquake resulting invisible damage to the dam or appurtenances	2
	Earthquake resulting in uncontrolled release of water from the dam	3
Terrorist acts/Security threat	Observed behavior reasonably indicative of preoperational planning related to terrorism or other criminal activity upon dam, appurtenances, or outlet works	1
	Supervisory control and data acquisition (SCADA) system hacked and unplanned water releases occur	2
	Verified explosive device threat that, if carried out, could result in damage to the dam	2
	Detonated explosive device that has resulted in damage to the dam or appurtenances	3
Sabotage/vandalism	Damage to dam or appurtenances with no impacts to the functioning of the dam	1
	Modification to the dam or appurtenances that could adversely impact the functioning of the dam	1
	Damage to dam or appurtenances that has resulted in seepage flow	2
	Damage to dam or appurtenances that has resulted in uncontrolled water release	3

EXAMPLES OF EMERGENCY SITUATIONS

The following are examples of conditions that would usually constitute an emergency situation that may occur at Bear Valley Dam. Adverse or unusual conditions that can cause the failure of a dam are typically related to aging or design and construction oversights. Extreme weather events that exceed the original designed conditions can caused significant flow through the auxiliary spillway or overtopping of the embankment. However, accidental or intentional damage to the dam may also result in emergency conditions. The conditions have been grouped to identify the most likely emergency-level condition. The groupings are provided as guidance only. Not all emergency conditions may be listed, and the General Manager is urged to use conservative judgment in determining whether a specific condition should be defined as an emergency situation at the dam.

5.4.1 Pre-existing Conditions on Bear Valley Dam

There has been very slow groundwater seepage through pressure release pipes and very slow seepage along both embankments. The seepage constitutes a total of a few gallons per minute. There has been no change in seepage rates since it was first documented.

5.4.2 Spillway Flows

Emergency Level 2 Example

A large flood is expected to occur or is occurring. The lake level is full. The main 36" outlet works valve is fully opened. The service spillway gates are fully opened and flowing. All parts of the dam are functioning normally; no erosion is occurring. Properties around the lake's edge are beginning to flood. Edison workers and recreational activities downstream should cease and be evacuated. The Sheriff should begin preparing to evacuate lakefront properties if flooding is forecasted to continue.

Emergency Level 3 Example

A large flood is occurring. The lake level is one (1) foot over full and both spillways are fully opened. There is visible erosion and a blown out retaining culvert wall on the service spillway. All downstream activities should cease and immediate evacuations should take place downstream and around the lakefront.

5.4.3 Dam Crest Overtopping

Emergency Level 2 Example

A probable maximum flood (PMF) is occurring and the spillways are both operating at full capacity. The lake level continues to rise and is within one (1) foot of overtopping the dam crest. Properties around the lake's edge are beginning to flood. The Sheriff should be actively evacuating homes around the lake's edge and preparing for evacuation of Edison workers and recreational visitors downstream.

Emergency Level 3 Example

A probable maximum flood (PMF) is occurring, the spillways are both operating at full capacity, and the dam's crest is overtopped by one (1) foot. Water is continuing to rise and there is erosion at the toe of the dam's abutments. All

activities downstream should cease and immediate evacuations should take place. Properties around the lake's edge shall be evacuated immediately.

5.4.4 Seepage

Emergency Level 2 Example

Cloudy seepage or soil deposits are observed at seepage exit points or from internal drain outlet pipes. Or, existing seepage points are increasing in flow with clear or cloudy discharge. At this level, the lake should be lowered to relieve pressure and search for seepage source. The Division of Safety of Dams or local engineer should be contacted for remediation procedures. If seepage continues to increase, go to level 3.

Emergency Level 3 Example

New rapid seepage is found or existing seepage has become rapid and is uncontrollable. More seepages may be opening up. Seepage may be caused by an earthquake. Heavy aftershocks may contribute to Dam failure. Downstream activities should cease and immediate evacuation of Edison personnel and recreational visitors should take place.

5.4.5 Movement or Cracking

Emergency Level 2 Example

Earthquake has caused significant increase in length, width, or offset of cracks of the embankment crest, slopes, abutments, and/or foundation, and breaching of the dam appears imminent or is in progress. Close monitoring needs to be performed and evacuation procedures should be arranged.

Emergency Level 3 Example

An earthquake has caused major damage and the dam has been breached. Immediate evacuation of Edison personnel and recreational visitors should take place if possible.

Emergency Level 3 Example

A terrorist has fired a rocket propelled grenade from the Highway 18 Bridge at the middle of the dam structure. Major cracking and seepage has occurred. Immediate evacuation of Edison personnel and recreational visitors should take place. The dam should be carefully inspected by State Dam Safety Officials and monitored closely by BBMWD personnel.

6. NOTIFICATION AND COMMUNICATION – STEP3

6.1 NOTIFICATION

After the emergency level has been determined, the people on the following notification charts for the appropriate emergency level shall be notified immediately.

6.2 COMMUNICATION

6.2.1 Emergency level1:

The General Manager should contact the California Division of Safety of Dams to describe the situation and request technical assistance if necessary.

6.2.2 Emergency Level2:

The General Manager should contact the Sheriff. The following message may be used to help describe the emergency situation to the Sheriff if the General Manager is not available:

"This is (identify name, position),

We have an emergency condition at the Bear Valley Dam, located approximately four miles west of the Town of Big Bear Lake on Highway 18 We have activated the Emergency Action Plan for the dam and are currently under Emergency Level 2.

We are implementing predetermined actions to respond to a rapidly developing situation that could result in dam failure.

Please prepare to evacuate any recreational visitors below the dam in Bear Creek, personnel from Edson's power facility, and prepare the Seven Oaks Dam for inundation.

Reference the inundation map in your copy of the Emergency Action Plan. We will advise you when the situation is resolved or if the situation gets worse.

I can be contacted at the following number_____. If you cannot reach me, please call the following alternative number_____."

6.2.3 Emergency Level 3:

The General Manager should contact the Sheriff immediately and the area below the dam and possibly around the Lake should be evacuated (see *inundation map* tab). The following actions should be taken:

a. Call the Sheriff's dispatch center. Be sure to say, "This is an emergency. "They will call other authorities and the media and begin the evacuation. The following message may be used to help describe the emergency situation to the Sheriff:

"This is an emergency. This is (name, position).
Bear Valley Dam, located approximately four miles west of the town of Big Bear Lake on Highway 18 is failing. The downstream are a must be evacuated immediately. Repeat, Bear Valley Dam is failing; evacuate Bear Canyon below the dam, evacuate the Edison personnel downstream and immediately prepare the Seven Oaks Dam for inundation.

We have activated the Emergency Action Plan for this dam and are currently Emergency Level 3. Reference the inundation map in your copy of the Emergency Action Plan.

I can be contacted at the following Number (xxx-xxx-xxxx). If you cannot reach me, please call the following alternative number (xxx-xxx-xxxx).

b. Do whatever is necessary to bring people in immediate danger (anyone on the dam, downstream from the dam, boating on the lake or evacuees) to safety if directed by the Sheriff.

c. Keep in frequent contact with the Sheriff and emergency services to keep them up to date on the condition of the dam. They will tell you how you can help handle the emergency.

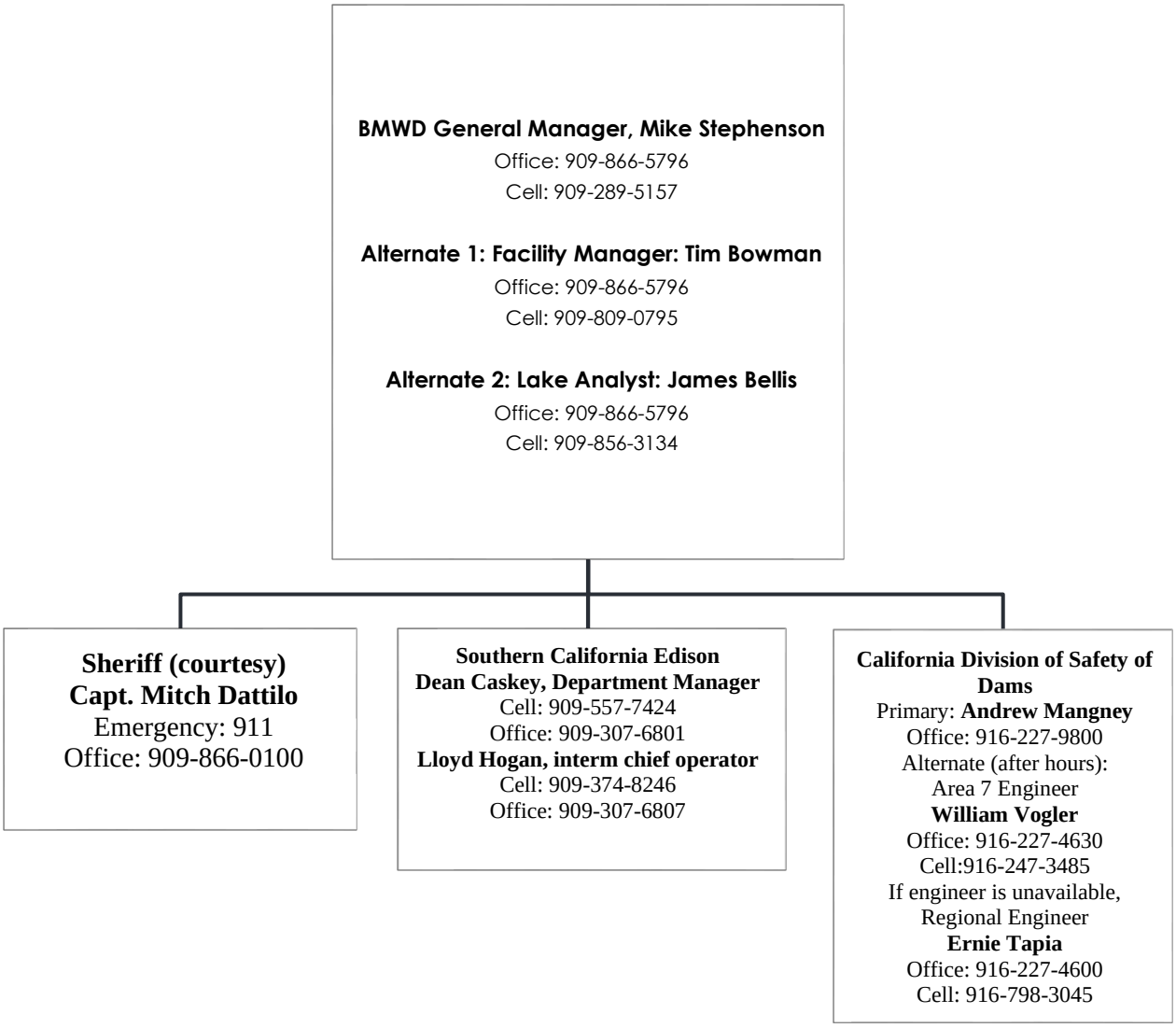
d. If all means of communication are lost: (1) try to find out why, (2) try to get to another radio or telephone that works, or (3) get someone else to try to re-establish contact with the Sheriff and emergency services.

The following pre scripted message may be used as a guide for the Sheriff to communicate the status of the emergency with the public:

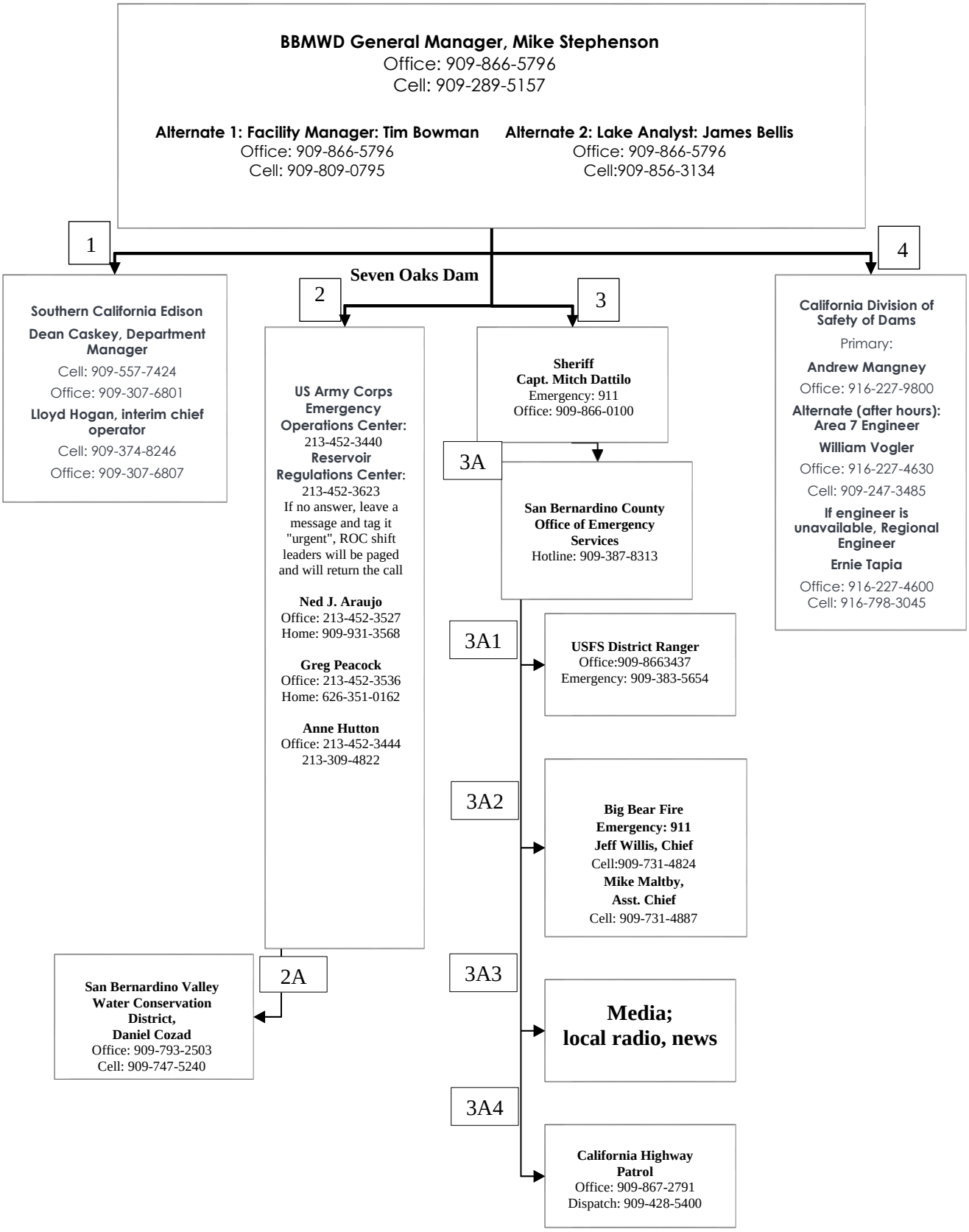
"Attention: This is an emergency message from the Sheriff. Listen Carefully. Your life may depend on immediate action. Bear Valley Dam, located 4 miles west of the Town of Big Bear Lake, is failing. If you are in or near this area, proceed immediately to high ground away from the canyon (or Lake's edge – depending on situation). Do not travel into the canyon; you cannot out-drive or out-run a flood wave. Proceed immediately to high ground away from the canyon."

6.3 EMERGENCY LEVEL NOTIFICATION CHARTS

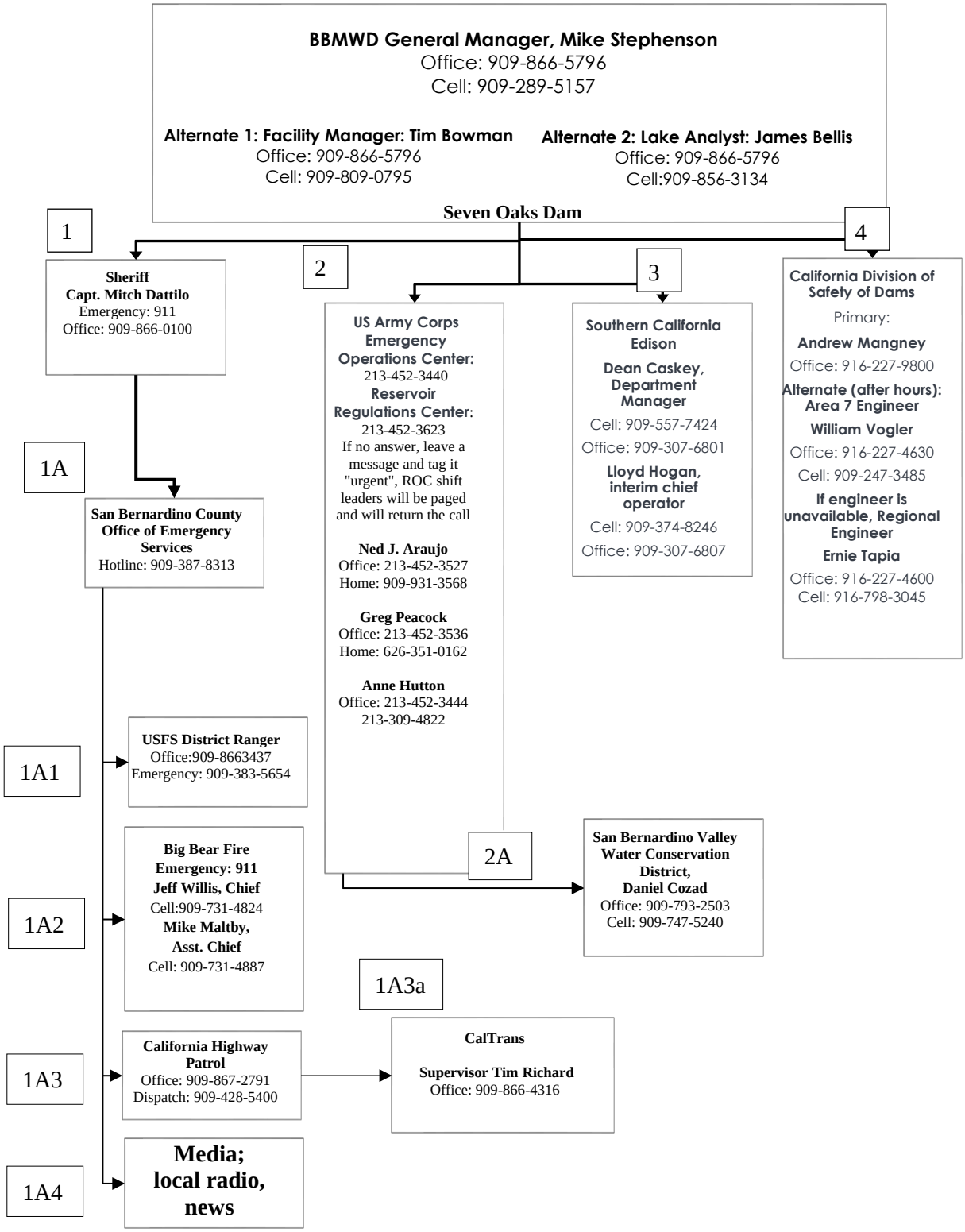
6.3.1 Level 1 Notification



6.3.222 Level 2 Notification



6.3.223 Level 3



6.3.4 Emergency Services Contacts

Agency/ Organization	*Full Name*	*Primary Contact*	*Address*	*Office Phone*	*Cell Phone*	*Emergency /Other Phone*
Big Bear Fire	Big Bear Fire Authority	Jeff Willis, Chief			909-731-4824	9-1-1
		Mike Maltby, Asst. Chief			909-731-4887	
BBMWD	Big Bear Municipal Water District	Mike Stephenson, General Manager	PO Box 2863, Big Bear Lake, CA 92315	909-866-5796	909-289-5157	
		Alternate: James Bellis, Lake Analyst			909-856-3134	
		Alternate: Tim Bowman, Facility Manager			909-809-0795	
California DSOD	California Division of Safety of Dams	Andrew Mangney	PO Box 942836 Sacramento, CA 95818	916-227-9800		
		Alternate: William Vogler		916-227-4630	916-247-3485	
		Alternate: Ernie Tapia		916-227-4630	916-798-3045	
Cal OES	California Office of Emergency Services	California Warning Center				916-845-8911
CHP	California Highway Patrol		31230 Highway 18, Running Springs, CA 92382	909-867-2791		909-428-5400
CalTrans	California Department of Transportation	Tim Richard, Supervisor		909-866-4316		
Sheriff	San Bernardino County Sheriff	Mitch Dattilo, Captain	PO Box 2803 Big Bear Lake, California 92315	909-866-0100		9-1-1
County OES	San Bernardino County Office of Emergency Services	Duty Officer	1743 Miro Way, Rialto, CA 92376	909-356-3998		909-387-8313/ 909-356-3911
SBVWCD	San Bernardino Valley Water Conservation District	Daniel Cozad	1630 West Redlands Boulevard, Redlands, CA 92373	909-793-2503	909-747-5240	
Edison	Southern California Edison	Dean Caskey, Department Manager	7865 Santa Ana Canyon Rd. Highland, CA 92346	909-307-6801	909-557-7424	
		Lloyd Hogan, Interim Chief Operator		909-307-6807	909-374-8246	
USFS Ranger	United States Forest Service	District Ranger, Mark Stamer	PO BOX 290, Fawnskin, CA 92333	909-866-3437		909-383-5654
Seven Oaks Dam, Army Corps	United States Army Corps of Engineers, Seven Oaks Dam	Emergency Operations Center				213-452-3440
		Reservoir Regulations Center				213-452-3623
		Ned J. Araujo		213-452-3527		Home: 909-931-3568
		Greg Peacock		213-452-3536		Home: 626-351-0162
		Anne Hutton		213-452-3444		Cell: 213-309-4822

7. EXPECTED ACTIONS – STEP 4

If the sheriff receives a 9-11 call regarding observations of an unusual or emergency event at the dam, they should immediately contact the Big Bear Municipal Water District office. After the BBMWD General Manager determines the emergency level, the following actions should be taken. If time permits, the California Division of Safety of Dams (DSOD) should be contacted for technical consultation.

7.1 EMERGENCY LEVEL 1–NONEMERGENCY, UNUSUAL EVENT; SLOWLY DEVELOPING

A. The BBMWD General Manager, Lake Analyst and/or Dam Keeper should inspect the dam. At a minimum, inspect the full length of the upstream slope, crest, downstream toe, and downstream slope. Also check the reservoir area, abutments, and downstream stream for signs of changing conditions. **If increased seepage, erosion, cracking or settlement are observed, immediately report the observed conditions to the DSOC; refer to the emergency level table for guidance in determining the appropriate event level for the new condition and recommended actions.**

B. Record all contact that were made on the *Contact Checklist Log* (Appendix A-1). Record all information, observations, and actions taken on the *Event Log Form* (Appendix A-2). Note the time of changing conditions. Document the situation with photographs and video, if possible.

C. The BBMWD General Manager should contact the DSOD and request technical staff to investigate the situation and recommend corrective actions.

7.2 EMERGENCY LEVEL 2 – POTENTIAL DAM FAILURE SITUATION; RAPIDLY DEVELOPING

A. The BBMWD General Manger should contact the DSOD to report the situation and, if time permits, request technical staff to investigate the situation and recommend corrective actions.

B. The BBMWD General Manager should contact the Sheriff to inform him that the EAP has been activated and if current conditions get worse, an emergency situation may require evacuation. Preparations should be made for possible evacuations and closures.

C. The BBMWD General Manager should contact Southern California Edison, give information about the emergency and advise them to evacuate their personnel from the Edison power facility downstream.

D. The BBMWD General Manager should contact the Army Corps of Engineers at Seven Oaks Dam, give information about the emergency, advise them to evacuate their personnel from the Seven Oaks Dam collection basin, and advise them to prepare the Seven Oaks Dam and basin for possible inundation.

E. Provide updates to the Sheriff and emergency services personnel to assist them in making timely decisions concerning the need for warnings, road, closures, and evacuations.

F. If time permits, the General Manager should inspect the dam. At a minimum inspect the full length of the upstream slope, crest, downstream toe, and downstream slope. Also check the reservoir area, abutments, and downstream stream for signs of changing conditions. If piping, increased seepage, erosion,

cracking, or settlement are observed, immediately report the observe3d conditions to the DSOD; refer to the emergency level table for guidance in determining the appropriate event level for the new condition and recommend actions

G. Record all contacts that were made on the Contact Checklist (Appendix A-1). Record all information, observations, and actions taken on the Event Log Form (Appendix, A-2). Note the time of changing conditions. Document the situation with photographs and video, if possible.
H. If time permits, the following emergency remedial actions should be taken as appropriate.

7.2.1 Emergency Remedial Actions

If time permits, the following emergency remedial actions should be considered for Emergency Level 2 conditions. Immediate implementation of these remedial actions may delay, moderate, or prevent the failure of the dam. Several of the listed adverse or unusual conditions may be apparent at the dam at the same time, requiring implementation of several modes of remedial actions. Close monitoring of the dam must be maintained to confirm the success of any remedial action taken at the dam. Time permitting, any remedial action should be developed through consultation with DSOD. See Resources Available (Appendix B-1) for sources of equipment and materials to assist with remedial actions.

Embankment Overtopping

1. If the water level in the reservoir is no longer rising, place sandbags along the low areas of the top of the dam to control wave action, reduce the likelihood of flow concentration during minor overtopping, and to safely direct more water though the spillway.
2. Cover the weak areas of the top of the dam and downstream slope with riprap, sandbags, plastic sheets, or other materials to provide erosion-resistant protection.

Seepage and sinkholes

1. Open the outlet works (spillways gates if necessary) to lower the reservoir level as rapidly as possible to a level that stops or decreases the seepage to a non-erosive velocity. If the outlet works or gates are damaged or blocked, pumping or siphoning may be required.
2. If the entrance to the seepage origination point is observed in the reservoir (possible whirlpool) and is accessible, attempt to reduce the flow by plugging the entrance with readily available materials such as hay bales, bentonite, soil or rock fill, or plastic sheeting.
3. Construct sand bag or other types of ring dikes around seepage exit areas to retain a pool of water, providing back pressure and reducing the erosive nature of the seepage. Alternatively, if possible, cover the seepage exit area(s) with several feet of sand/gravel to hold fine-grained embankment or foundation materials in place.
4. Prevent vehicles and equipment from driving between the seepage exit points and the embankment to avoid potential loss from the collapse of an underground void.

Embankment Movement

1. Open outlet works and lower the reservoir to a safe level at a rate commensurate with the urgency and severity of the condition of the movement. If the outlet

works are damaged or blocked, pumping or siphoning may be required.

2. Repair settlement of the crest by placing sandbags or earth and rock fill materials in the damaged area to restore freeboard.
3. Stabilize sides by placing a soil or rock fill buttress against the toe of the movement area.

Earthquake

1. Immediately conduct a general overall visual inspection of the dam
2. Perform a field survey to determine if there has been any settlement and movement of the dam embankment, spillway, and outlet works.
3. Drain the reservoir if required.

7.3 EMERGENCY LEVEL 3 –URGENT; DAM FAILURE APPEARS IMMINENT OR IS IN PROGRESS

1. The BBMWD General Manager shall immediately contact the Sheriff, Edison, and the Army Corps (Seven Oaks Dam) and other shown on the notification chart.
2. The Sheriff shall lead the efforts to carry out warnings, close roads, and evacuate people at risk downstream from the dam (see *Inundation Map* tab).
3. Emergency management services personnel shall alert the public and immediately evacuate at-risk people and close roads, as necessary.
4. The BBMWD General Manager shall maintain continuous communication and provide the Sheriff with updates of the situation to assist him in making timely decisions concerning warnings and evacuations.
5. The BBMWD General Manager should record all contact that were made on the *Contact Checklist* (Appendix A-1). Record all information, observations, and actions taken on the *Event Log Form* (Appendix A-2). Note the time of changing conditions. Document the situation with photographs and video, if possible.
6. Advise people monitoring the dam to follow safe procedures. Everyone should stayaway from any of the failing structures or slopes and out of the potential breach inundation areas.

8. TERMINATION – STEP 5

Whenever the EAP has been activated, an emergency level has been declared, all EAP actions have been completed, and the emergency is over, the EAP operations must eventually be terminated and follow-up procedures completed.

8.1 TERMINATION RESPONSIBILITIES

The BBMWD General Manager and Sheriff are responsible for deciding when to terminate the EAP. The Sheriff is responsible for terminating the EAP operations and relaying this decision to other emergency agencies and personnel. It is then the responsibility of each person to notify the same group of contacts that were notified during the original event notification process to inform those people that the event has been terminated.

Prior to termination of an Emergency Level 3 event that has not caused actual dam failure, the DSOD will inspect the dam or require the dam be inspected by the BBMWD to determine whether any damage has occurred that could potentially result in loss of life, injury, or property damage. If it is determined that conditions do not pose a threat to people or property, the Sheriff will be advised to terminate EAP operations as described above.

The BBMWD General Manger shall assure that the Dam Safety Emergency Situation Report (Appendix A-3) is completed to document the emergency event and all cautions that were taken. The BBMWD shall distribute copies of the completed report to the DSOD and Sheriff office.

9. MAINTENANCE – EAP REVIEW AND REVISION

9.1 ANNUAL REVIEW

The BBMWD General Manger will review and, if needed, update the EAP at least once each year. The EAP annual review will include the following:

- Calling all contacts on the three notification charts in the EAP to verify that the phone numbers and persons in the specified positions are current. The EAP will be revised if any of the contacts have changed.
- Contacting the local law enforcement agency to verify the phone numbers and persons in the specified positions. In addition, the BBMWD General Manger will ask if the person contacted knows where the EAP is kept and if responsibilities described in the EAP are understood.
- Calling the locally available resources to verify that the phone numbers, addresses, and services are current.

9.2 REVISIONS

The BBMWD General Manager is responsible for updating the EAP document. The EAP document held by the BBMWD is the master document. When revisions occur, the BBMWD will provide the revised pages and revised revision summary page to all the EAP document holders. The document holders are responsible for revising outdated copy of the respective document(s) whenever revisions are received. Outdated pages shall be immediately discarded to avoid any confusions with the revisions.

9.3 EAP PERIODIC TEST

The BBMWD will host and facilitate a periodic test of the EAP at least once every 5 years.

The periodic test will consist of a meeting, including a tabletop exercise, conducted at the BBMWD District Office. Attendance should include the BBMWD General Manager, Lake Analyst, DSOD representative, the Captain of the Sheriff's Department, a representative from the US Army Corps of Engineers, a representative from Southern California Edison, and others with key responsibilities listed in the EAP. At the discretion of the BBMWD, other organizations that may be involved with an unusual or emergency event at the dam are encouraged to participate. Before the table top exercise begins, meeting participants will visit the dam during the periodic test to familiarize themselves with the damsite.

The tabletop exercise will begin with the facilitator presenting a scenario of an unusual or emergency event at the dam. The scenario will be developed prior to the exercise. Once the scenario has been presented, the participants will discuss the responses and actions that they would take to address and resolve the scenario. The narrator will control the discussion, ensuring realistic responses and developing the scenario throughout the exercise. The BBMWD General Manager should complete an event log as they would during an actual event.

After the tabletop exercise, the five sections of the EAP will be reviewed and discussed. Mutual aid agreements and other emergency procedures can be discussed. The BBMWD will prepare a written summary of the periodic test and revise the EAP, as necessary.

10. RECORD OF HOLDERS OF CONTROL COPIES OF THIS EAP

COPY NUMBER	*ORGANIZATION*	*PERSON RECEIVING COPY*
1	BBMWD	Mike Stephenson, Dam Keeper
2	Big Bear Fire	Jeff Willis
3	California DSOD	Andrew Magney
4	CHP	Running Springs Office
5	CalTrans	Tim Richard
6	Sheriff	Mitch Dattilo
7	County OES	Office
8	San Bernardino Valley Water Conservation Dist.	Daniel Cozad
9	Edison	Dean Caskey
10	USFS	Office, Big Bear Discovery Center
11	Army Corps (Seven Oaks Dam)	Ned Araujo

11. RECORD OF REVISIONS AND UPDATES MADE TO EAP

REVISION NUMBER	*DATE*	*REVISIONS MADE*	*BY WHOM*
1	February 12, 2015	First Draft Complete	James Bellis, BBMWD
2	January 2016	11 Draft	Jim Weber, BBMWD
3	April 2016	12 Draft	James Bellis, BBMWD
4	January 14, 2019		Brittany Lamson, BBMWD
5	July 1, 2019	Update contacts, correct formatting issues	Katie Estes, BBMWD

CONCURRENCES

By my signature, I acknowledge that I, or my representative, have reviewed this plan and concur with the tasks and responsibilities assigned herein for me and my organization.

X	X
Jeff Willis	Daniel Cozad
Chief, Big Bear Lake Fire Protection District	San Bernardino Valley Water Conservation ...
X	X
Andrew Mangney	Dean Caskey
California Division of Safety of Dams	Southern California Edison
X	X
	Mark Stamer
California Highway Patrol	United States Forest Service
X	X
Tim Richard	Ned J. Araujo
California Department of Transportation	United States Army Corps of Engineers
X	X
	Mitch Dattilo
San Bernardino County Office of Emergency...	Captain, San Bernardino County Sheriff

APPENDICIES

FORMS, GLOSSARY, MAPS, AND SUPPORTING DATA

APPENDIX A

A-1 CONTACT CHECK LIST
A-2 UNUSUAL OR EMERGENCY EVENT LOG FORM
A-3 DAM EMERGENCY SITUATION REPORT FORM
A-4 GLOSSARY OF TERMS

APPENDIX B

B-1 RESOURCESAVAILABLE
B-2 LOCATION AND VICINITY MAPS
B-3 WATERSHED PROJECTMAP
B-4 RESIDENTS/BUSINESSES/HIGHWAYS AT RISK
B-5 PLAN VIEW OF THEDAM
B-6 PROFILE OFSPILLWAYS
B-7 RESERVOIR ELEVATION-AREA-VOLUME-AND SPILLWAY CAPACITY DATA
B-8 NATIONAL INVENTORY OF DAMS (NID) DATA

APPENDIX C

C-1 INUNDATION MAPS

APPENDIX A

CONTACT CHECKLIST

Bear Valley Dam Big Bear Municipal Water District
Date_____

The following contacts should be made immediately after the emergency level is determined (see emergency levels tab for guidance to determine the appropriate emergency level for a specific situation). The person making the contacts should initial and record the time of the call and who was notified for each contact made. See the Notification Charts tab for critical contact information and Emergency Services Contacts tab for contact information for other possible emergency services.

EMERGENCY LEVEL1 (*see page 11)*	*PERSON CONTACTED*	*TIME CONTACTED*	*CONTACTED BY*
☐ Southern California Edison			
☐ California Division of Safety of Dams			
☐ Sheriff (courtesy)			

EMERGENCY LEVEL2 (*see page 12)*	*PERSON CONTACTED*	*TIME CONTACTED*	*CONTACTED BY*
☐ Southern California Edison			
☐ US Army Corps (Seven Oaks Dam)			
☐ Sheriff			
☐ California Division of Safety of Dams			

EMERGENCY LEVEL3 (*see page 13)*	*PERSON CONTACTED*	*TIME CONTACTED*	*CONTACTED BY*
☐ Sheriff			
☐ US Army Corps (Seven Oaks Dam)			
☐ Southern California Edison			
☐ California Division of Safety of Dams			

APPENDIX A

UNUSUAL OR EMERGENCY EVENT LOG

(To be completed during the emergency)

DAM NAME: Bear Valley Dam COUNTY: San Bernardino

WHEN AND HOW WAS THE EVENT DETECTED?

WEATHER CONDITIONS:

GENERAL DESCRIPTION OF THE EMERGENCY SITUATION:

Emergency Level Determination:_____ Made By:

ACTIONS AND EVENT PROGRESSION

DATE	*TIME*	*ACTION/EVENT PROGRESSION*	*TAKEN BY*

Report prepared by:_____ Date:

APPENDIX A

UNUSUAL OR EMERGENCY EVENT LOG

(To be completed following the termination of the emergency)

DAM NAME: Bear Valley Dam NATIONAL INVENTORY OF DAMS NO.:CA00757

DAM LOCATION: 4 miles west of the town of Big Bear Lake at the intersection of Highway 18 and Highway 38 in San Bernardino County, California. The dam drains into Bear Creek which is part of the upper Santa Ana River Watershed.

DATE:_____ TIME:

_____

WEATHERCONDITIONS:

_____

GENERAL DESCRIPTION OF EMERGENCY SITUATION:

AREA(S) OF DAM AFFECTED:

EXTENT OF DAM DAMAGE:

POSSIBLE CAUSE(S):_____

_____

EFFECT OF DAM'S OPERATION:_____

_____

INITIAL RESERVOIR ELEVATION:_____

DATE/TIME:_____

MAXIMUM RESERVOIR ELEVATION:_____
DATE/TIME:_____

FINAL RESERVOIR ELEVATION:_____

DATE/TIME:_____

DESCRIPTION OF AREA FLOODED DOWNSTREAM/ DAMAGES/ INJURIES/ LOSS OF LIFE:

OTHER DATA AND COMMENTS:

OBSERVER'S NAME AND TELEPHONE NUMBER:

_____

Report Prepared By:_____**Date:**

_____

APPENDIX A

GLOSSARY OF TERMS

Abutment That part of the canyon wall against which the dam is constructed. The left and right abutments of dams are defined with the observer looking downstream from the dam

Acre-foot A unit of volumetric measure that would cover one (1) acre to a depth of one (1) foot.

One acre-foot is equal to 43,560 cubic feet or 325,850 gallons.

Berm A nearly horizontal step (bench) in the upstream or downstream sloping face of the dam.

Boil A disruption of the soil surface due to water discharging from below the surface. Eroded soil may be deposited in the form of a ring (miniature volcano) around the disruption.

Breach An opening through the dam that allows draining of the reservoir. A controlled breach is an intentionally constructed opening. An uncontrolled breach is an unintended failure of the dam.

Conduit A closed channel (round pipe or rectangular box) that conveys water through, around, or under the dam.

Control section A usually level segment in the profile of an open channel spillway above which water in the reservoir discharges through the spillway.

Cross section A slice through the dam showing elevation vertically and direction of natural water flow horizontally from left to right. Also, a slice through a spillway showing elevation vertically and left and right sides of the spillway looking downstream.

Dam An artificial barrier generally constructed across a watercourse for the purpose of impounding or diverting water.

Dam failure The uncontrolled release of a dam's impounded water.

Dam Operator The person(s) or unit(s) of government with responsibility for the operation and

maintenance of dam. In this EAP's case the Big Bear Municipal Water District Dam Keeper, General Manager, or Lake Analyst.

Drain, toe or foundation, or Blanket A water collection system of sand and gravel and typically pipes along the downstream portion of the dam to collect seepage and convey it to a safe outlet.

Drainage area (watershed) The geographic area on which rainfall flows into the dam.

Drawdown The lowering or releasing of the water level in a reservoir

over time or the volume lowered or released over a particular period of time.

Emergency A condition that develops unexpectedly, endangers the structural integrity of the dam and/or downstream human life and property, and requires immediate action

Emergency Action Plan A formal document identifying potential emergency conditions that may occur at the dam and specifying preplanned actions to minimize potential failure of the dam or minimize failure consequences including loss of life, property damage, and environmental impacts.

Evacuation Map A map showing the geographic area downstream of a dam that should be evacuated if itis threatened to be flooded by a breach of the dam or other large discharge.

Filter The layers of sand and gravel in a drain that allow seepage through an embankment to discharge into the drain without eroding the embankment soil.

Freeboard Vertical distance between a stated water level in the reservoir and the top of the dam.

Gate, slide or Sluice An operable, watertight valve to manage the discharge of water from the dam.

Groin The area along the intersection of the face of a dam and the abutment.

Hazard Classification A system that categorized dams (high, significant, or low) according to the degree of their potential to create adverse incremental consequences such as loss of life, property damage, or environmental impacts of a failure or mis-operation of a dam.

Height, dam The vertical distance between the lowest point along the top of the dam and the lowest point at the downstream toe which usually occurs in the bed of the outlet channel

Hydrograph, outflow, or breach A graphical representation of either the flow rate or flow depth at a specific point above inflow or below the dam over time for a specific flood occurrence.

Incident Commander The highest predetermined official available at the scene of an emergency situation.

Instrumentation An arrangement of devices installed into or near dams that provide measurements to evaluate the structural behavior and other performance parameters of the dam and appurtenant structures.

Inundation The geographic area downstream of the dam that would be flooded by a breach of the

Map	dam or other large discharge.
Notification	To immediately inform appropriate individuals, organizations, or agencies about to potentially emergency situation so they can initiate appropriate actions.
Outlet Works	An appurtenant structure that provides for controlled passage of normal water flows through the dam.
Piping	The progressive destruction of an embankment or embankment foundation by internal erosion of the soil by seepage flows.
Probable Maximum Precipitation (PMP or Flood (PMF)	The theoretically greatest precipitation or resulting flood that is meteorologically feasible for a given duration over a specific drainage area at a particular geographical location.
Reservoir	The body of water impounded or potentially impounded by the dam.
Riprap	A layer of large rock, precast blocks, bags of cement, or other suitable material, generally placed on an embankment or along a watercourse as protection against wave action, erosion, or scour.
Risk	A measure of the likelihood and severity of an adverse consequence.
Seepage	The natural movement of water through the embankment, foundation, or abutments of the dam.
Slide	The movement of a mass of earth down a slope on the embankment or abutment of the dam.
Spillway	The appurtenant structure that provides the controlled conveyance of excess water through, over, or around the dam.
Spillway capacity	The maximum discharge the spillway can safely convey with the reservoir at the maximum design elevation.
Spillway crest	The lowest level at which reservoir water can flow into the spillway.
Tailwater	The body of water immediately downstream of the embankment at a specific point in time.
Toe of dam	The junction of the upstream or downstream face of an embankment with the ground surface.
Top of dam (crest of dam)	The elevation of the uppermost surface of an embankment which can safely impound water behind the dam.

APPENDIX B

EMERGENCY REPAIRS MEMORANDUM OF UNDERSTANDING

AVAILABLE RESOURCES

Locally available equipment, labor, and materials:

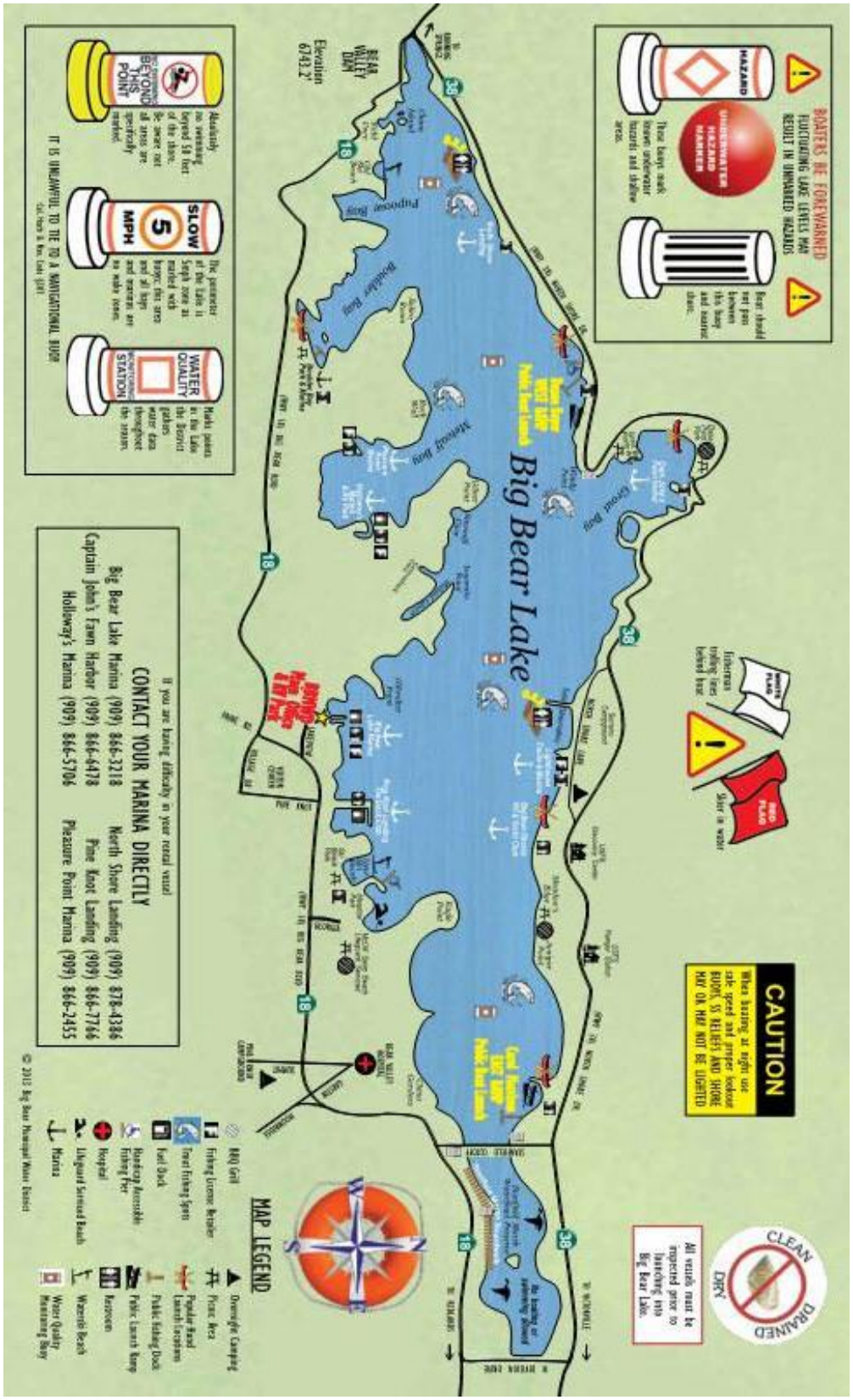
BBMWD has the following equipment available:

- Forklift (Clark)
- Back Hoe (Volvo)
- Skid Steer (Caterpillar)
- Dump Truck (International 26000 Gross Vehicle Weight)
- Dump truck (Dodge 1ton)
- 6 patrol boats (*for evacuation efforts, emergency escorts, and patrol of dam if needed))*
- Maintenance barge with crane (¼ ton lift capacity)
- Pontoon boat (*for runabout, delivery of small equipment and tools*) Local contractors and materials:

HEAVY EQUIPMENT OPERATORS	***SAND AND GRAVEL SUPPLY***	***READY-MIX CONCRETE SUPPLY***
Bear Valley Paving 909-866-4746	Robertson's Ready-Mix	Robertson's Ready-Mix
Ken Willis Construction 909-585-3224		
Romans Construction 909-866-4270		
Mile High Equipment 909-866-6642		
HEAVY EQUIPMENT RENTAL		
Mile High Equipment Rental 909-866-6642		
PUMPS/SIPHONS	***DIVING CONTRACTORS***	***SAND BAGS***
		Robertson's Ready-Mix

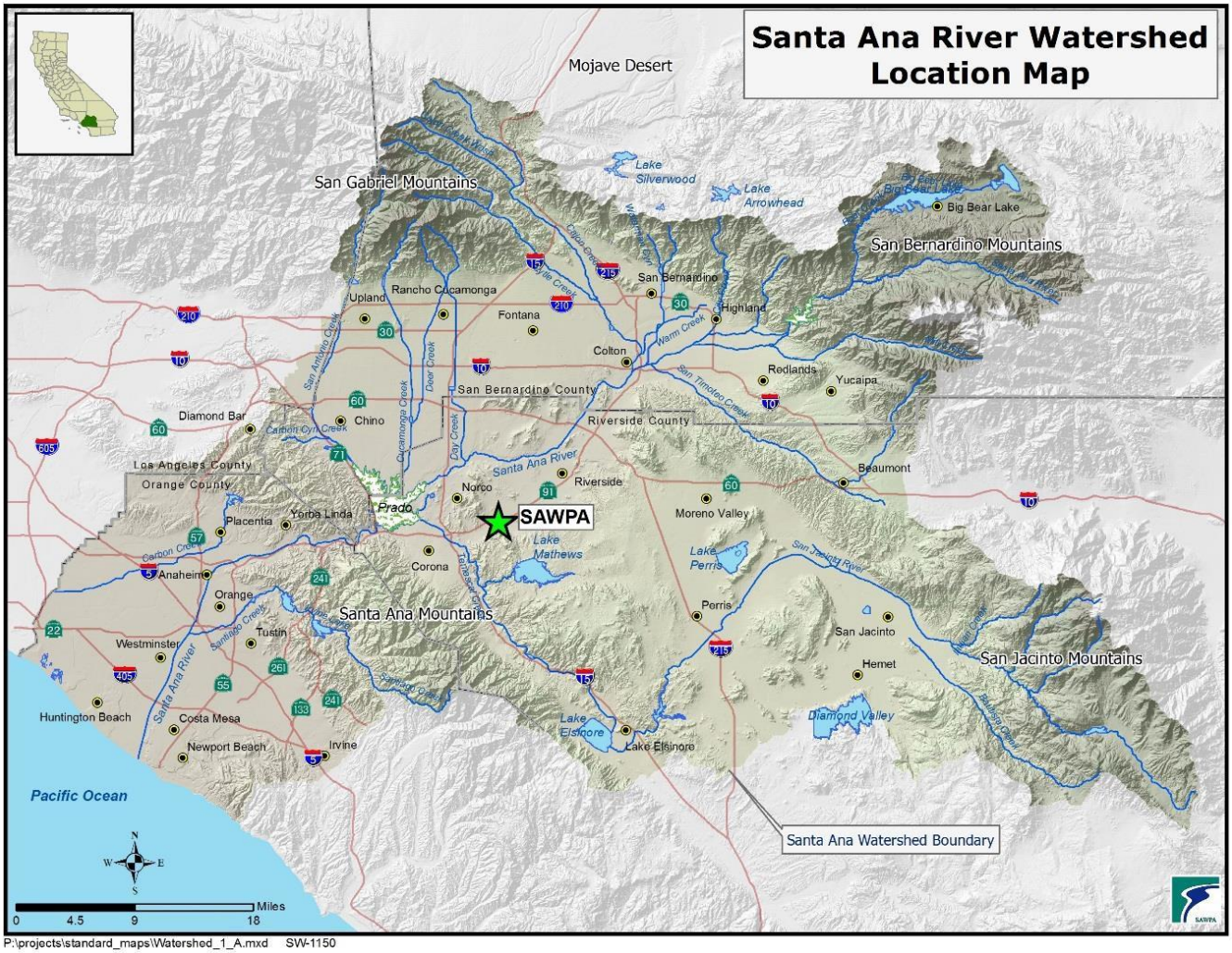
APPENDIX B

LOCATION AND VICINITY MAPS



APPENDIX B

WATERSHED PROJECT MAP



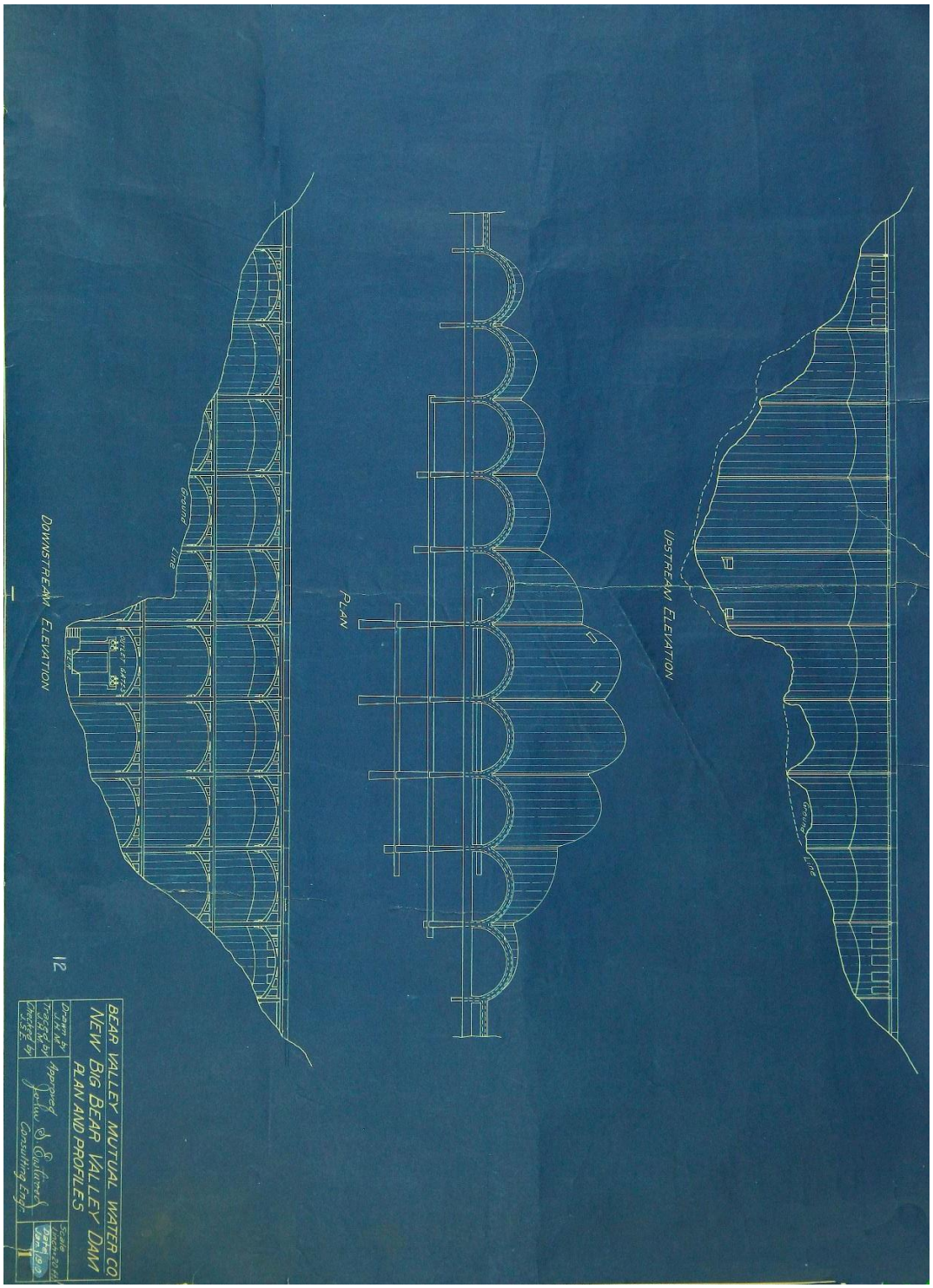
APPENDIX B

RESIDENTS/BUSINESSES/HIGHWAYS AT RISK

1. All Lakefront Private and Business Parcels (If flooding is occurring)
2. Highway 18 Bridge
3. Edison Power Plant
4. Seven Oaks Dam
5. Recreational Visitors/Campers below the Dam
6. Stanfield Cutoff (If flooding is occurring)
7. Division Ave. (If flooding is occurring)

APPENDIX B

PLAN VIEW OF THE DAM



BEAR VALLEY
DAM
SHEET Nº 1
SECTIONAL EL-
EVATION OF DAM
SCALE 1/10" = 1'
C. of PRESSURE
C. of PRESSURE
RESULTANT

APPENDIX B

PLAN VIEW OF THE DAM

APPENDIX B

RESERVOIR ELEVATION-AREA-VOLUME-AND SPILLWAY CAPACITY DATA

Location of Dam: SW Section 22, Township 2N, Range 1W, San Bernardino Base and Meridian Latitude: 34.242273; Longitude: -116.977110
Route to Dam: Approximately 4 miles west of the town of Big Bear Lake via State Highway 18, or approximately 24 miles east of the intersection of State Highways 18 and 330.

Height: 91 feet
Built: 1912
Hazard Classification: High
Type of Structure: Concrete Multiple Arch. Ten arches (bays) ranging in height from 15' to 91' founded on a foundation of sound crystalline rock. Total crest length is 360' feet. Bays have been filled with mass concrete to form a virtual gravity dam with an upstream slope of 0.75:1 and a vertical downstream face from the crest to elevation 6,691.0' below which the face slopes 0.25:1. The downstream side of the dam is further stabilized by eleven 1.5' to 5.0' wide buttresses located between each bay. Additional steel ties and reinforcements have been added to the buttresses for maximum stabilization. See detailed design in Appendix B.5

Normal Maximum Water Elevation: 6,743.2'
Storage Volume:
73,320-acre feet Lake
Surface Area: 2,973
acres
Watershed Drainage Area: 37 square miles
Secondary Flood Control Structures: Seven Oaks Dam, 9
miles downstream Dam Operator: BBMWD
Major Property Owner: USFS
National Inventory of
Dams No.: CA00757 Dam
Designer: R.W. Beck and
Associates

APPENDIX B

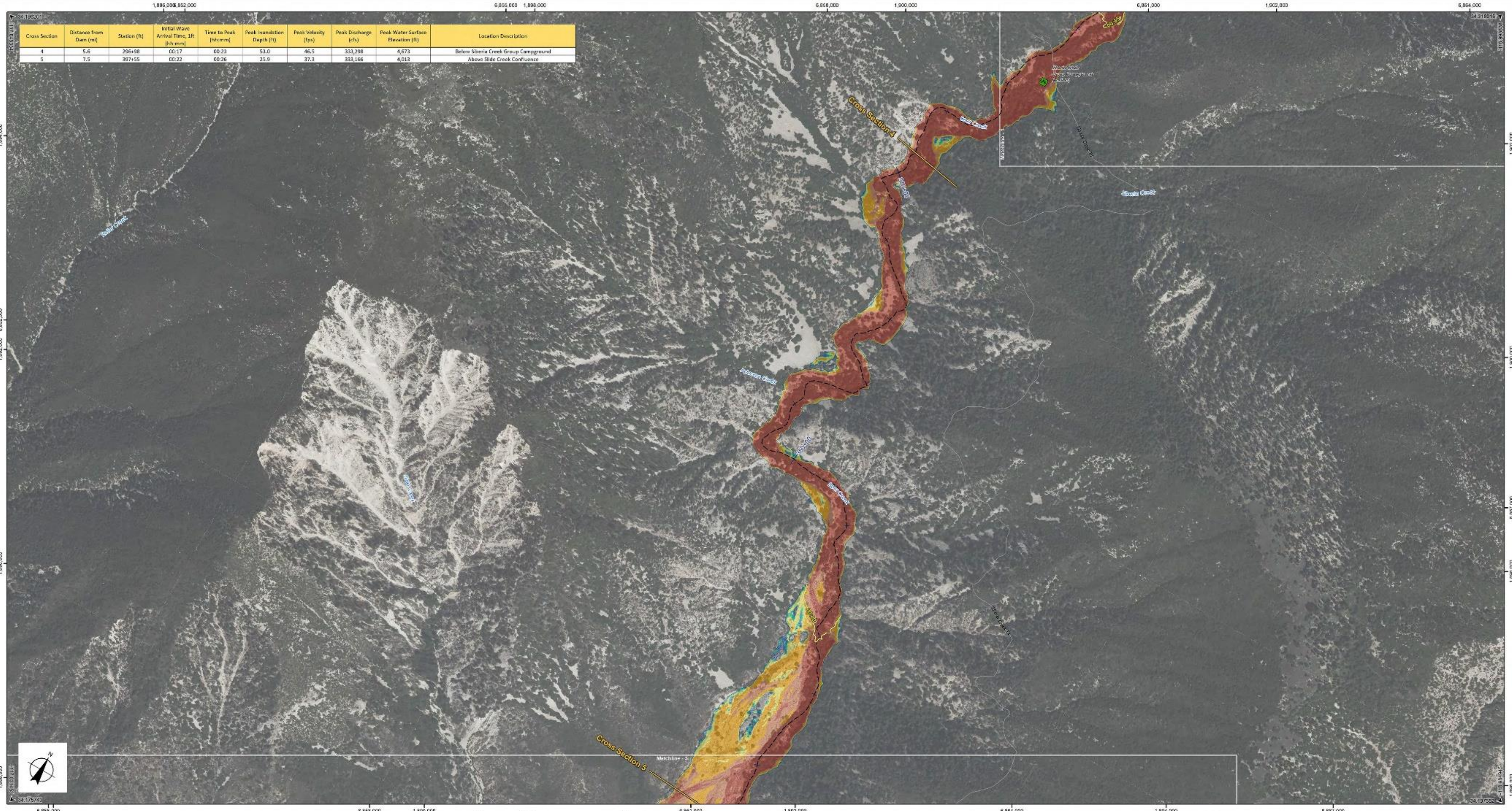
NATIONAL INVENTORY OF DAMS (NID) DATA

Dam Name	BEAR VALLEY
River	BEAR CREEK
State	CA
County	SAN BERNARDINO
Owner Name	BIG BEAR MUNICIPAL WATER DISTRICT
Private Dam	N
NID Storage	96000
Max Discharge	2820
Max Storage	96000
Drainage Area	38.7
Longitude	-116.9775
Latitude	34.2423
Dam Designer	
Core	
Other Dam Name	BIG BEAR LAKE
Foundation	R
EAP	NR
Inspection Date	4/19/2012
Spillway Type	C
Spillway Width	0
NIDID	CA00757
Owner Type	Public Utility
Dam Type	Multi-Arch
Primary Purpose	Irrigation
All Purposes	Irrigation, Water Supply, Recreation
Inspection Frequency	1
Year Completed	1911
Surface Area	2649
State Reg Dam	Y
State Reg. Agency	Division of Safety of Dams
State ID	2015
Section	S.22,T.2N,R.1W
Year Modified	
Outlet Gates	
Volume	4684
Number Of Locks	
Length Of Locks	0
Width Of Locks	
Fed Funding	
Fed Design	
Fed Construction	
Fed Regulatory	
Fed Inspection	
Fed Operation	
Fed Owner	
Fed Other	
Source Agency	CA
Submit Date	03/01/2013

Congressional District	CA08
Political Party	R
Normal Storage	74000
Congressional Rep.	Paul Cook (R)
Other Structure Id	-
Url Address	-
Number of Separate Structures	0
Permitting Authority	Y
Inspection Authority	Y
Enforcement Authority	Y
Jurisdictional Dam	Y
Dam Former Name	-
Eap Last Rev Date	-
NID Height (Ft.)	80
Dam Length (Ft.)	360
Dam Height (Ft.)	80
Structural Height (Ft.)	
Hydraulic Height (Ft.)	80

APPENDIX C
INUNDATION MAPS

Cross Section	Distance from Dam (mi)	Station (ft)	Initial Wave Arrival Time, 1ft (hh:mm)	Time to Peak (hh:mm)	Peak Inundation Depth (ft)	Peak Velocity (fps)	Peak Discharge (cfs)	Peak Water Surface Elevation (ft)	Location Description
4	5.6	296+98	00:17	00:23	53.0	46.5	333,298	4,673	Below Siberia Creek Group Campground
5	7.5	397+55	00:22	00:26	25.9	37.3	333,166	4,013	Above Slide Creek Confluence

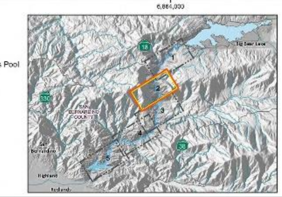


Legend

- Bridge
- Possible Day Use Area
- Diversion Dam
- Powerhouse
- Flow Path
- Cross Section
- Approx. Time to 1 Foot Depth (hrs:mins)
- Approx. Maximum Flooding Extent
- Big Bear Lake / Seven Oaks Pool
- Incorporated City

Maximum Inundation Depth (feet)

- 1 to 2
- 2 to 3
- 3 to 6
- 6 to 12
- 12 to 18
- Greater than 18



Notes:

1. This map was developed for the benefit of local emergency managers and the California Governor's Office of Emergency Services. The information shown is approximate and should be used as a guide for emergency response and preparation.
2. The inundation map meets all applicable state and federal standards and has been prepared in consideration of potential downstream hazards by a licensed civil engineer.
3. The results presented herein do not reflect the structural integrity of the dam and are not a statement of the dam's safety. The analysis presented is based on a hypothetical dam failure of Bear Valley Dam using 2D modeling software.
4. Cross Section Values:
   Distance from Dam and Stationing are reckoned from the centerline of Bear Valley Dam along the displayed Flow Path.
   Distance from Dam is in miles and **Stationing** is in feet (Stationing 12+34 = 1,234').
   Initial Wave Arrival Time, 1 Foot is the time to achieve 1 foot of water depth after initiation of the dam break.
   Time to Peak is the time to achieve the maximum water depth after initiation of the dam break.
   Deflood Time, 1 Foot is the time elapsed from the flood wave arrival time until water recedes to within one foot of its preflood water elevation.
4. Cross Section Values continued:
   Peak Inundation Depth is the maximum water depth.
   Peak Velocity is the maximum velocity.
   Peak Discharge is an estimate of the maximum flow rate integrated over the entire cross section line.
   Peak Water Elevation is the maximum water surface elevation.
   Location Description indicates major roads that cross, or are near, the Flow Path at that cross section.
5. The values displayed in the table for each cross section are the maximum for that parameter along each cross section line, except for the **Initial Wave Arrival Time, 1 Foot and Time to Peak** which are the minimum for that parameter along each cross section line.
6. For other details refer to the supporting report "Bear Valley Dam Inundation Technical Study" September 2020.
7. Structures are shown in the aerial photo on the maps but may not clearly display all possible structures potentially within the inundation limits.
8. Map projection: State Plane, California Zone V, Feet, North American Datum 1983. **Border Tics** display these coordinate values. All elevations are referenced to North American Vertical Datum 1988.

Data Sources: Incorporated City Limits from CalFire, January 2017. Licensed Healthcare Facilities from Office of Statewide Health Planning and Development, January 2018. Schools, Fire Stations and Law Enforcement Facilities from Geographic Names Information System (GNIS), October 2017. Highways are from CalTans, 2018. Aerial NAIP 2018.

Inundation Depth Map

Sunny Day Hypothetical Failure of

Bear Valley Dam

Flood Depth and Arrival Time

National Dam ID: CA00757 State Dam ID: 2015.000

Detail Sheet 2 of 5

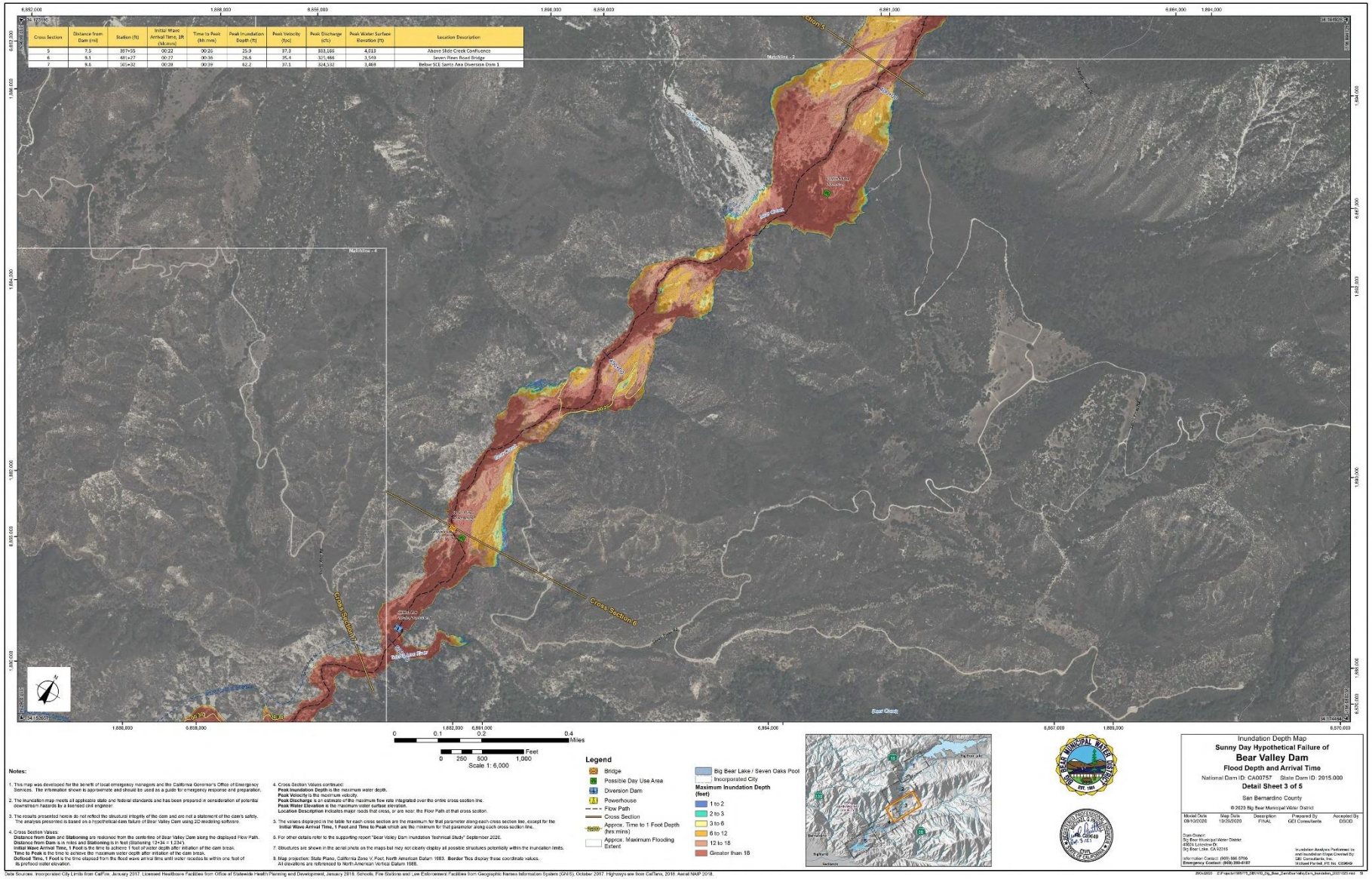
San Bernardino County

Model Date	Map Date	Description	Prepared By	Accepted By
09/10/2020	10/29/2020	FINAL	GEI Consultants	DSOD

Dam Owner:
Big Bear Municipal Water District
40524 Lakeview Dr.
Big Bear Lake, CA 92315

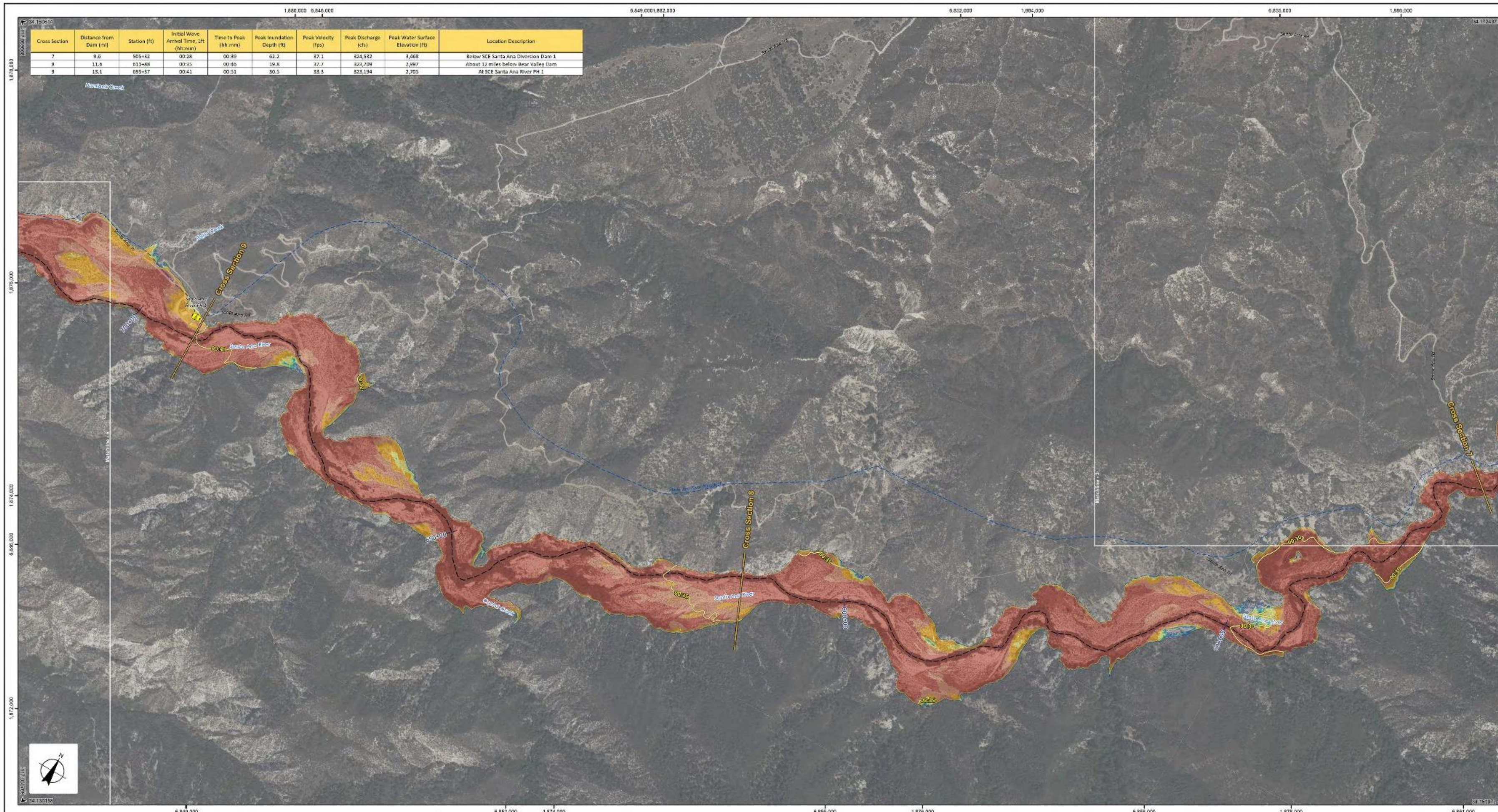
Information Contact: (909) 866-5796
Emergency Contact: (909) 289-5157

Inundation Analysis Performed by and Inundation Maps Created By:
GEI Consultants, Inc.
Michael Parrell, PE No. C88648



Cross Section	Distance from Dam (mi)	Station (ft)	Initial Wave Arrival Time, 1ft (hh:mm)	Time to Peak (hh:mm)	Peak Inundation Depth (ft)	Peak Velocity (fps)	Peak Discharge (cfs)	Peak Water Surface Elevation (ft)	Location Description
5	7.5	397+55	00:22	00:26	25.9	37.3	333,166	4,613	Above Slide Creek Confluence
6	9.1	481+27	00:37	00:36	26.6	35.4	325,466	3,549	Seven Pines Road Bridge
7	9.6	505+32	00:28	00:39	62.2	37.1	324,532	3,468	Below SCE Santa Ana Diversion Dam 1

Cross Section	Distance from Dam (mi)	Station (ft)	Initial Wave Arrival Time, 1ft (hh:mm)	Time to Peak (hh:mm)	Peak Inundation Depth (ft)	Peak Velocity (fps)	Peak Discharge (cfs)	Peak Water Surface Elevation (ft)	Location Description
7	9.6	505+32	00:28	00:39	62.2	37.1	324,532	3,468	Below SCE Santa Ana Diversion Dam 1
8	11.6	611+88	00:35	00:46	19.8	37.7	323,709	2,997	About 12 miles below Bear Valley Dam
9	13.1	693+37	00:41	00:51	30.5	33.3	323,194	2,705	At SCE Santa Ana River PH 1



Legend

- Bridge
- Possible Day Use Area
- Diversion Dam
- Powerhouse
- Flow Path
- Cross Section
- Approx. Time to 1 Foot Depth (hrs:mins)
- Approx. Maximum Flooding Extent
- Big Bear Lake / Seven Oaks Pool
- Incorporated City

Maximum Inundation Depth (feet)

- 1 to 2
- 2 to 3
- 3 to 6
- 6 to 12
- 12 to 18
- Greater than 18

Notes:

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4. Cross Section Values continued:
   Peak Inundation Depth is the maximum water depth.
   Peak Velocity is the maximum velocity.
   Peak Discharge is an estimate of the maximum flow rate integrated over the entire cross section line.
   Peak Water Elevation is the maximum water surface elevation.
   Location Description indicates major roads that cross, or are near, the Flow Path at that cross section.
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Inundation Depth Map

Sunny Day Hypothetical Failure of

Bear Valley Dam

Flood Depth and Arrival Time

National Dam ID: CA00757 State Dam ID: 2015.000

Detail Sheet 4 of 5

San Bernardino County

Model Date	Map Date	Description	Prepared By	Accepted By
09/10/2020	10/29/2020	FINAL	GEI Consultants	DSOD

Dam Owner:
Big Bear Municipal Water District
40524 Lakeview Dr.
Big Bear Lake, CA 92315

Information Contact: (909) 866-5796
Emergency Contact: (909) 289-5157

Inundation Analysis Performed by and Inundation Maps Created By:
GEI Consultants, Inc.
Michael Fantell, PE No. C59649

Data Sources: Incorporated City Limits from CalFire, January 2017. Licensed Healthcare Facilities from Office of Statewide Health Planning and Development, January 2018. Schools, Fire Stations and Law Enforcement Facilities from Geographic Names Information System (GNIS), October 2017. Highways are from CalTrans, 2018. Aerial NAIP 2018.

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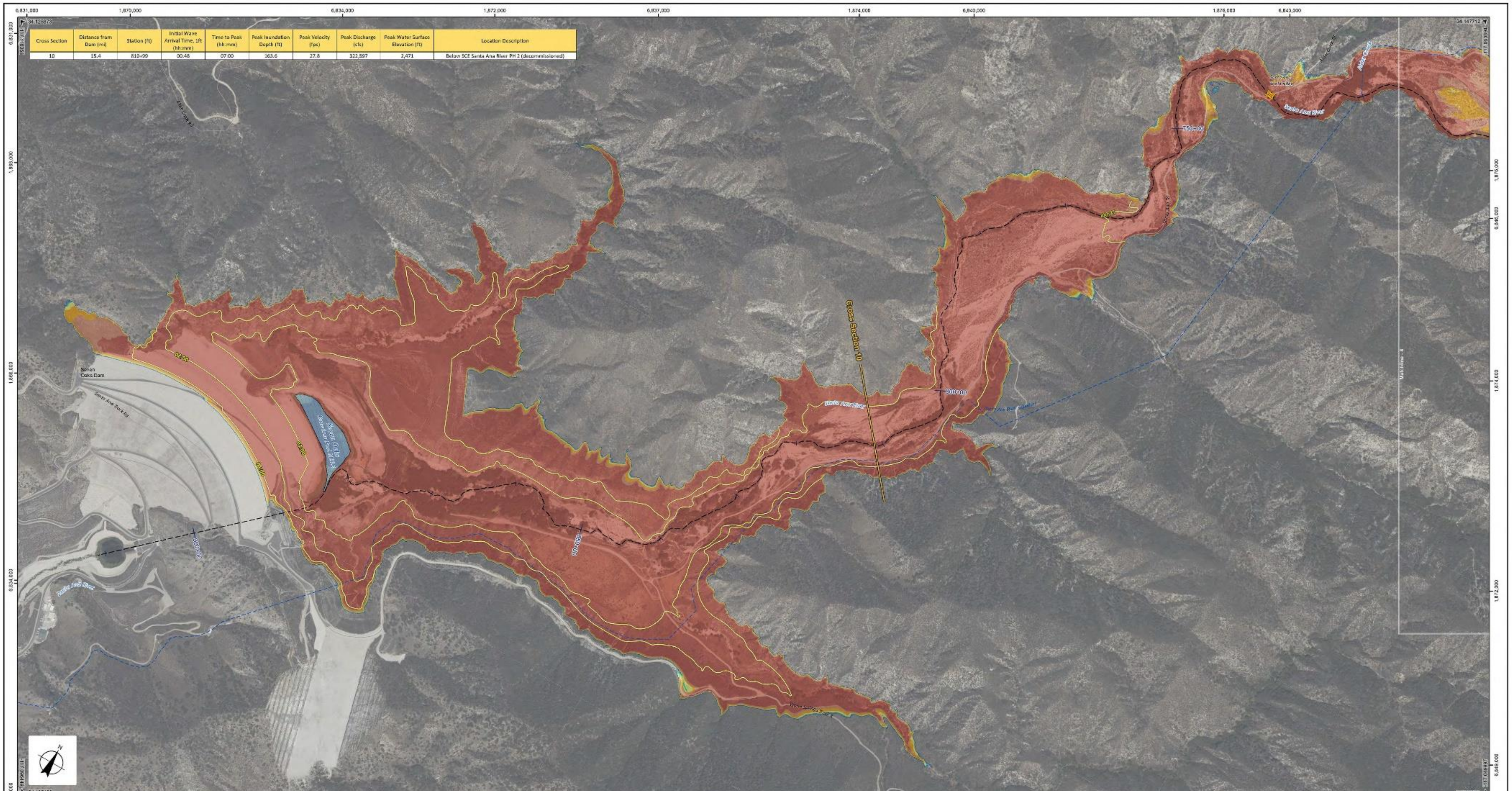
10	15.4	810+00	00:48	07:00	163.6	27.8	322,597	2,471	Below SCE Santa Ana River PH 2 (decommissioned)



0 0.1 0.2 0.4 Miles
0 250 500 1,000 Feet
Scale 1: 6,000

Notes:

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Legend

- Bridge
- Possible Day Use Area
- Diversion Dam
- Powerhouse
- Flow Path
- Cross Section
- Approx. Time to 1 Foot Depth (hrs:mins)
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- Incorporated City

Maximum Inundation Depth (feet)

- 1 to 2
- 2 to 3
- 3 to 6
- 6 to 12
- 12 to 18
- Greater than 18

Inundation Depth Map

Sunny Day Hypothetical Failure of

Bear Valley Dam

Flood Depth and Arrival Time

National Dam ID: CA00757 State Dam ID: 2015.000

Detail Sheet 5 of 5

San Bernardino County

Model Date	Map Date	Description	Prepared By	Accepted By
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APPENDIX K

[BIG BEAR LAKE DRAWDOWN PLAN ON FOLLOWING PAGE]

TO:	Mike Stephenson, BBMWD, Interim General Manager	**DATE:**	July 21, 2014
FROM:	Michael F. Rogers, Project Manager	**CC:**	Laurel Kaminski, John Haapala
SUBJECT:	Bear Valley Dam - Reservoir Operations Plan	**REF:**	See Below.

The purpose of this memorandum is to provide gate operation guidelines for Bear Valley Dam for use in planning Big Bear Lake ("lake") drawdown actions in advance of an approaching major storm.

Determining When Action is Required

When a major storm is approaching the watershed, the District may choose to decide how much water to release from the lake to accommodate runoff without flooding upstream properties. It is recognized that extreme rainfall events that cause the dam to overtop by more than one foot will begin to impact properties around Big Bear Lake. Figure 1 below indicates the pre-storm lake elevation that would result in one foot of overtopping of the dam for a range of total rainfall amounts. Below this curve, "No Action is Required" in advance of the storm. Above this curve, "Action is Required" (that is spillway operations and lake releases) to prevent flooding from lake levels that are more than one foot above the dam crest level.

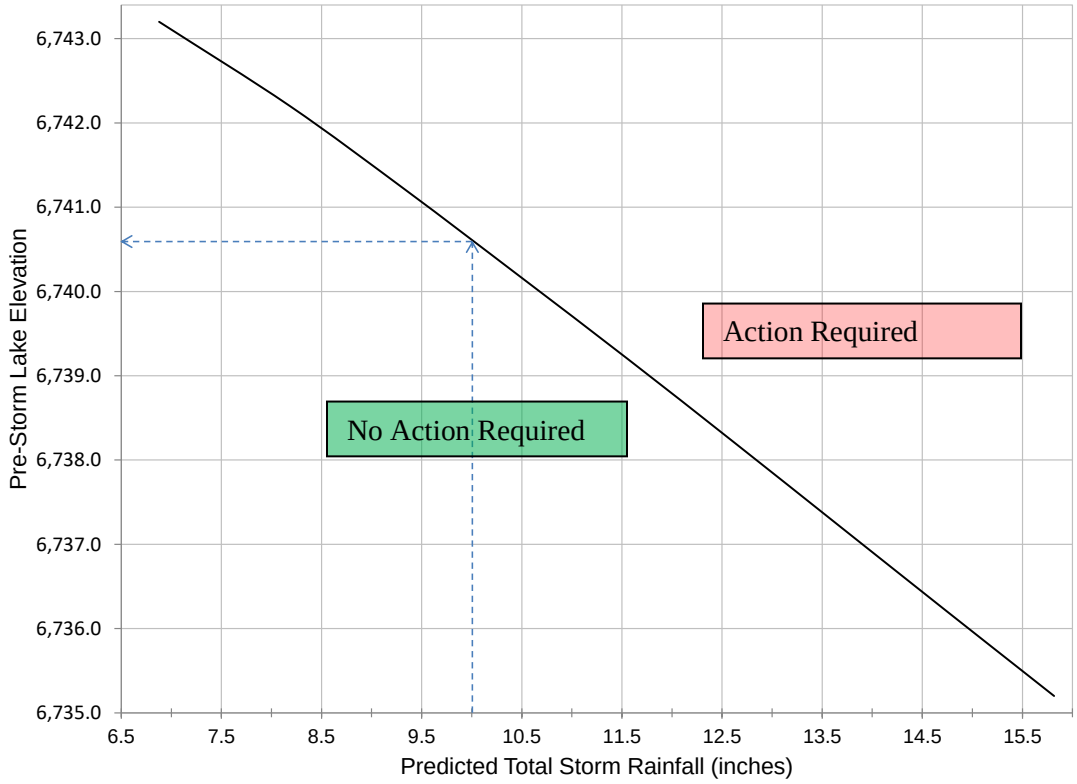


Figure 1: Lake Elevation to Accommodate Storm Runoff

For example, as shown on Figure 1, if the total predicted rainfall for an approaching storm was 10 inches, the lake elevation should be at about elevation 6,740.5' or lower to protect upstream properties. According to the curve shown on Figure 1, no action would be required with the lake at El. 6,740.5 or lower and a predicted rainfall of 10-inches or less. The relationship depicted in Figure 1 was determined by applying the U.S. Army Corps of Engineers HEC-1 Flood Hydrograph Package software (USACE, 1998), as described later in this memo.

Establishing a Pre-storm Lake Level Target

The graphical presentation (Figure 1) of pre-storm target lake elevation required to accommodate a range of rainfall amounts with one foot of overtopping is presented numerically in Table 1 (for even elevation increments) and Table 2 (for even rainfall increments), below.

Table 1: Lake Elevation to Accommodate Storm Runoff (even elevation increments)

Predicted Total Storm Rainfall (inches)	Pre-storm Elevation to Accommodate Storm Runoff
6.9	6743.2 '
8.2	6742.2 '
9.3	6741.2 '
10.5	6740.2 '
11.6	6739.2 '
12.6	6738.2 '
13.7	6737.2 '
14.7	6736.2 '
15.5	6735.5 '
15.8	6735.2 '

Table 2: Lake Elevation to Accommodate Storm Runoff (even rainfall increments)

Predicted Total Storm Rainfall (inches)	Pre-storm Elevation to Accommodate Storm Runoff
7	6743.1 '
8	6742.3 '
9	6741.4 '
10	6740.6 '
11	6739.7 '
12	6738.8 '
13	6737.8 '
14	6736.9 '
15	6735.9 '
15.8	6735.2 '

Time to Achieve Target Lake Level

Under ideal conditions, the lake will be maintained at or near the full elevation of 6,743.2 feet as much as possible. The District should plan to release water if a significant storm is forecasted with a nearly-full or full lake. The time required to reach the desired pre-storm lake level from a given pre-release lake elevation can be determined from the gate days plot show in Figure 2. A "gate day" is one gate opened for 24 hours, thus all 10 gates fully open for one day (24 hours) would be 10 gate days.

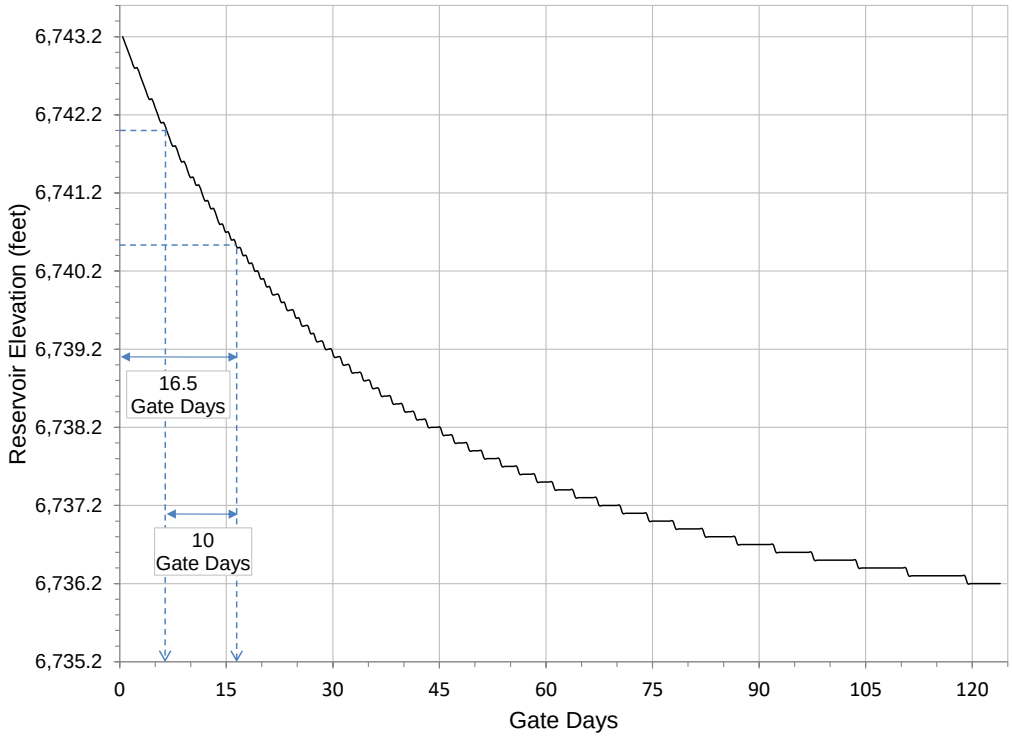


Figure 2: Gate Days - Outflow Timing with Zero Inflow

For example, if the lake is full to elevation 6743.2, and 10 inches of precipitation are expected to occur with an oncoming storm, the District would need approximately 16.5 gate days (i.e., 1 gate open for 16.5 days or 10 gates open for 1.65 days) to achieve the desired pre-storm elevation of 6,740.5' previously determined from Figure 1. If, however, the lake elevation is at 6,742.0' and 10" of precipitation are expected, the District would need approximately 10 gate days to achieve the desired pre-storm elevation of 6,740.5'. The process and assumptions used to create Figure 2 are described later in this memo.

Pre-Storm Release Lake Operations Plan

The post-release, pre-storm lake elevation that will accommodate runoff from the predicted total rainfall (Figure 1), and the number of gate days required to achieve that desired pre-storm elevation (Figure 2) are combined into the Pre-Storm Release Lake Operations Plan (Figure 3). The District can use Figure 3 to plan a lake drawdown for a range of predicted storms events between 50% and 119% of the

100-year storm. Based on the maximum gate flow for the current 10 gate configuration, storms with predicted total rainfall that is greater than 119% of the 100-year storm will result in more than one foot of overtopping at maximum stage if the pre-storm lake level is at the spillway crest elevation of 6735.2 feet, which is considered to be the maximum pre-storm drawdown.

On Figure 3, the different contour lines represent the lake elevation at the time when a storm is predicted, before any water has been released. The number of gate days is the amount of time required to release enough water to achieve a post-release, pre-storm lake elevation such that the dam would be overtopped by exactly one foot at maximum stage. As mentioned above, one foot or less of overtopping is considered to be the maximum allowable; if no overtopping of the dam is desired, additional volume allowance should be made. For example, if the 100-year storm (with a total of 13.3 inches of predicted rainfall (Cecilio, 2008)) was approaching and the lake was at capacity (elevation 6743.2'), the District would know they needed approximately 57 gate days of release to store the expected rainfall with one foot of over topping.

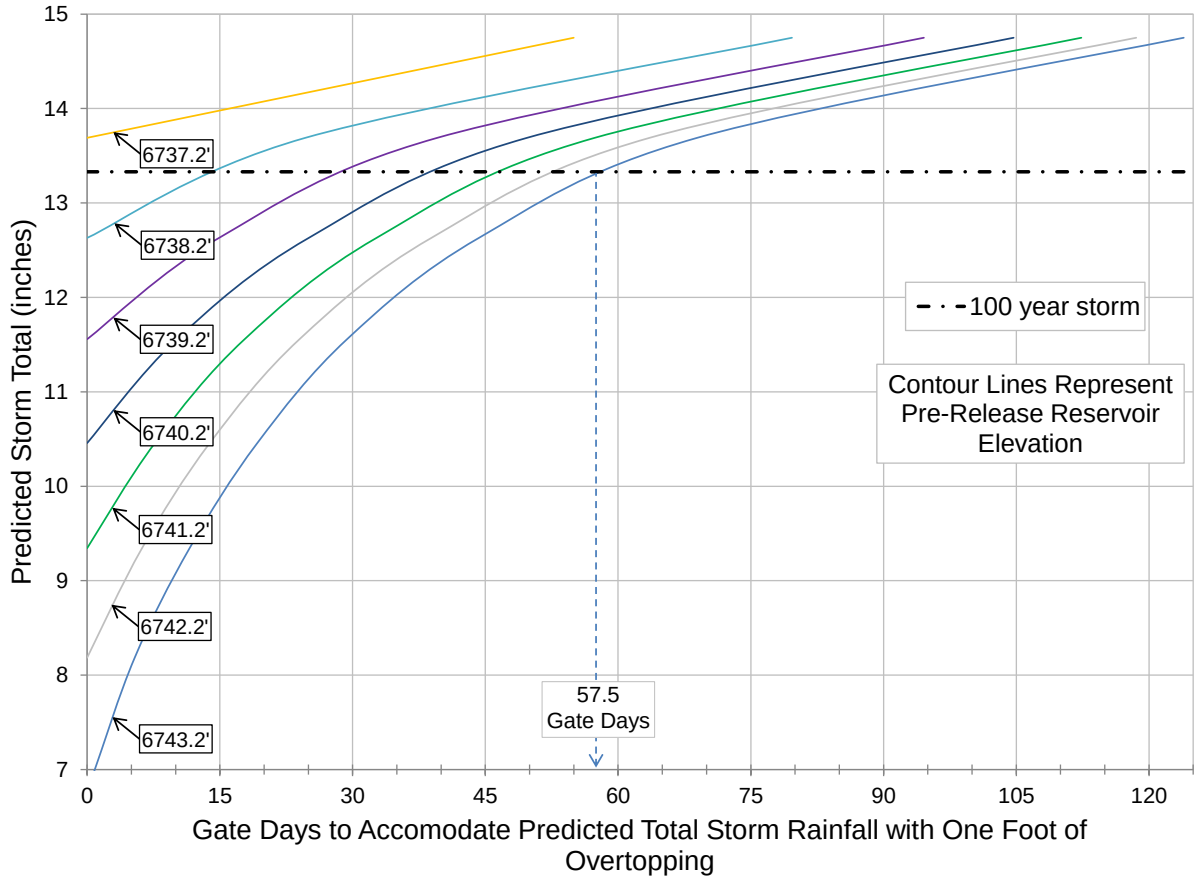


Figure 3: Pre-Storm Release Lake Operations Plan

Operations Guide Background: Methods

Determination of Action Levels for Pre-storm Drawdown Planning

The maximum lake elevation that will accommodate the predicted runoff from various storm events with one foot of overtopping at maximum stage was determined iteratively as follows.

Precipitation input to the watershed for a range of storm events were modeled as ratios between 50% and 119% of the 100-year storm hyetograph established for Big Bear watershed (Cecilio, 2008). Storm runoff inflow to the lake was modeled in HEC-1 using the watershed parameters previously established for the Big Bear watershed (Cecilio, 2008), with the exception of the portion of basin area that is impervious. Cecilio (2008) used an impervious area of 9%; however, for this analysis, the impervious area in the watershed was assumed to be equal to the lake surface area, resulting in a percent impervious equal to 11.4%.

The multi-flood analysis capability of the HEC-1 model was used to model runoff from various floods. Starting with a pre-storm lake level at the dam crest elevation of 6743.2', the range of multipliers applied to the 100-year storm hyetograph was refined until a storm that resulted in one foot of overtopping, i.e., a maximum stage of 6744.2', was determined. The total precipitation from the storm that resulted one foot of overtopping at a pre-storm elevation of 6,743.2 was added as a point on Figure 1. This process was repeated for pre-storm elevations down to the spillway elevation of 6735.5' in one foot intervals, resulting in the relationship plotted in Figure 1. An example multi-flood output file, including a review of parameters used to calculate the maximum stage for a range of storms, is included as Attachment 1 to this memorandum.

Determination of Pre-storm Drawdown Timing

The number of gate days of release required to achieve the desired pre-storm elevation was determined in HEC-1 using an assumption of zero lake inflow and the same outflow modeling as described above. HEC-1 computed 600 output values for each variable of lake elevation, lake volume, and flow rate through the gates. For each output lake elevation, the corresponding flow rate and incremental volume were used to determine the time required to drop to the next output lake elevation. Because the HEC-1 output only shows lake elevations to the tenths place, except when the lake level is dropping rapidly there are multiple time increments per elevation, giving the gate days plot a stepped appearance. For elevations with multiple time values, the average number of gate days was used to create the pre-storm release plot in Figure 3. The HEC-1 output file used to calculate the gate days is included as Attachment 2 to this memorandum.

Operations Guide Background: Assumptions

Gate Operations

The time variable "gate days" assumes that flow is the same through each of the 10 gates. Flow of water through the two outermost sluice gates is affected by proximity to the shoreline, and thus this statement is not precisely true. For lake drawdown planning purposes, however, it is reasonable to assume that all the gates are equivalent in discharge capacity, and that any combination of gates may be used to achieve the desired pre-storm elevation. Thus, for example, any six gates open for three days will have essentially the same effect on the lake elevation as any two gates open for nine days, as long as inflow does not vary over the same period.

In calculating the gate days to achieve the desired pre-storm lake elevation in Figure 2, it was assumed that regardless of the size of an approaching storm, the District would open gates fully to achieve the desired pre-storm lake elevation although partial gate openings for a longer

period of time could accomplish the same objective. Because of the very large number of output datasets that would result from varying the gate opening for each potential storm, only the fully open gate scenario was quantified.

Low-Level Outlet Operations

Lake outflow modeling used to establish the relationships plotted in Figure 1 and Figure 2 assumed that all gates were fully open at the start of and throughout the storm, but the low-level outlet was not. The outlet rating curves in Figure 4 show the relative flow in cubic feet per second (cfs) from the low-level outlet, the 10 gate spillway, flow over the dam crest, and the combination of all of these. Flow through the low-level outlet is a significant portion of the total outflow only at low lake elevations.

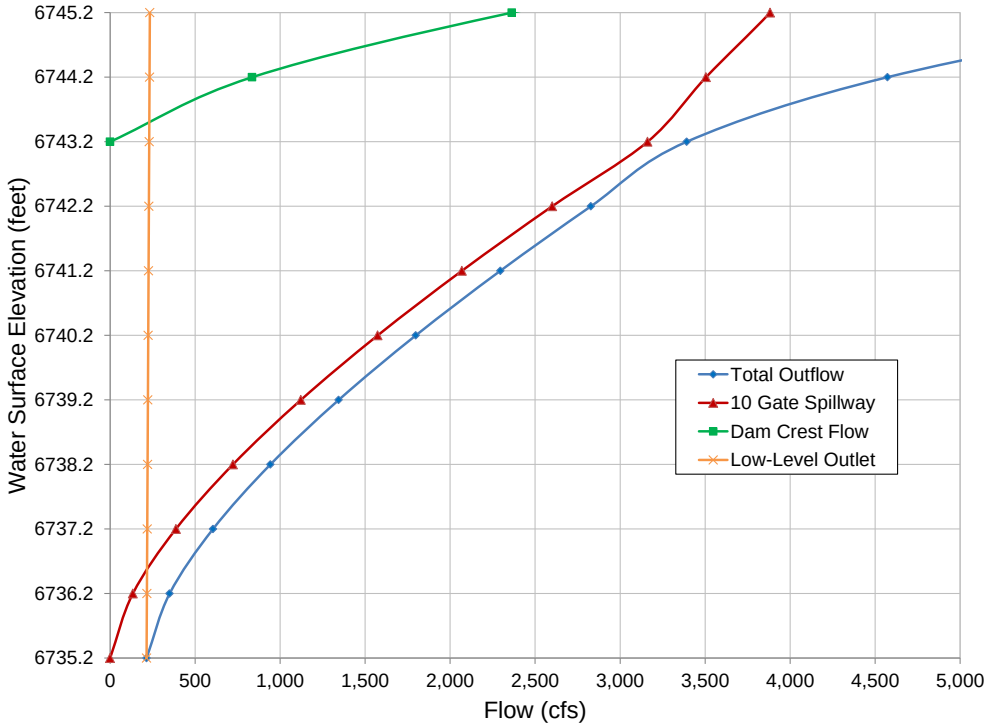


Figure 4: Lake Outflow Rating Curve

Base Inflow to the Lake

As noted above, the HEC-1 modeling used in the determination of gate days required to achieve the desired pre-storm elevation included zero inflow to the lake during the pre-storm period. Base flow to the lake in the absence of precipitation will vary seasonally, and could be quantified prior to finalizing the operations guide. In addition to the assumption of no dry weather base flow to the lake, the gate days model assumes that the District is able to achieve the pre-storm elevation during a period of no precipitation prior to initiation of the storm. Uncertainty related to inflow was compensated for by conservatively eliminating flow through the low-level outlet from this analysis. Therefore, we expect that minor lake inflow during the pre-storm drawdown period can be released using the low-level outlet system. The determination desired lake elevation for a range of storms (Figure 1) included a base flow of 39 cfs after the initiation of the storm (Cecilio, 2008).

Storm Runoff Flow to the Lake

In the multi-flood analysis used to construct Figure 1, it was assumed that the hyetograph for all storms will match the shape of the 100-year storm. Variation in the shape of the hyetograph will impact the timing of delivery of water to the lake, and therefore impact the peak stage. This variation is not expected to significantly impact the analysis described here, but that assumption could be verified with future data.

No seasonal or storm related variation was used to modify the unit hydrograph established by Cecilio (2008). In particular, in accordance with the study plan for this initial assessment, the analysis described herein included rainfall only and did not include precipitation falling as snow or snowmelt from an antecedent snowpack. It is noted that the PMF study (Cecilio 2008) did not include snowmelt. Specifically including snow and snowmelt would significantly expand the effort needed to perform the analysis and would require a significant data collection and calibration effort. However, melted snow (snow water equivalent) has the same effect as rainfall runoff. As an example of an approximate estimate, if it was known that there was an average of 2 inches of snow water equivalent available over the watershed that was likely to melt during the predicted storm, that amount should be added to the predicted storm runoff. More detailed studies would have to include estimates of the snow water equivalent by 1000-ft elevation band in the watershed, and time-series projections of other meteorological data including temperature and wind speed.

Reservoir Operations: Execution

Stage I – Data Collection

During the winter season of 2014-2015, hourly data will be collected, as available, on a daily basis, including:

a. Reservoir Level
b. Discharges
c. Weather data (from airport station – air temp, winds, humidity, air pressure, etc.)
d. Precipitation at available monitoring stations, including airport

In the summer of 2015, this data will be analyzed to validate assumptions included in the current study. If appropriate, recommendations will be made to increase the number of precipitation monitoring stations, including snow-pack measurements.

It is recognized that as of July 2014, the Big Bear Lake is significantly below the normal high water level. Therefore, it is expected that the District will collect as much natural runoff into the reservoir as possible.

Stage II – High-Water Operations

Once the lake level returns to near normal high-water level (top of arches), then reservoir operations will be conducted according to the plan identified herein. It is expected that this condition may be as early as the following 2015-2016 season, or later. Following each season of operations, the Plan provided herein will be reviewed and modified based on actual experiences.

Attachments

Attachment 1: Example HEC-1 Multi-flood Output for Determining Maximum Stage

Attachment 2: HEC-1 Output for Reservoir Outflow Rating Curve

References

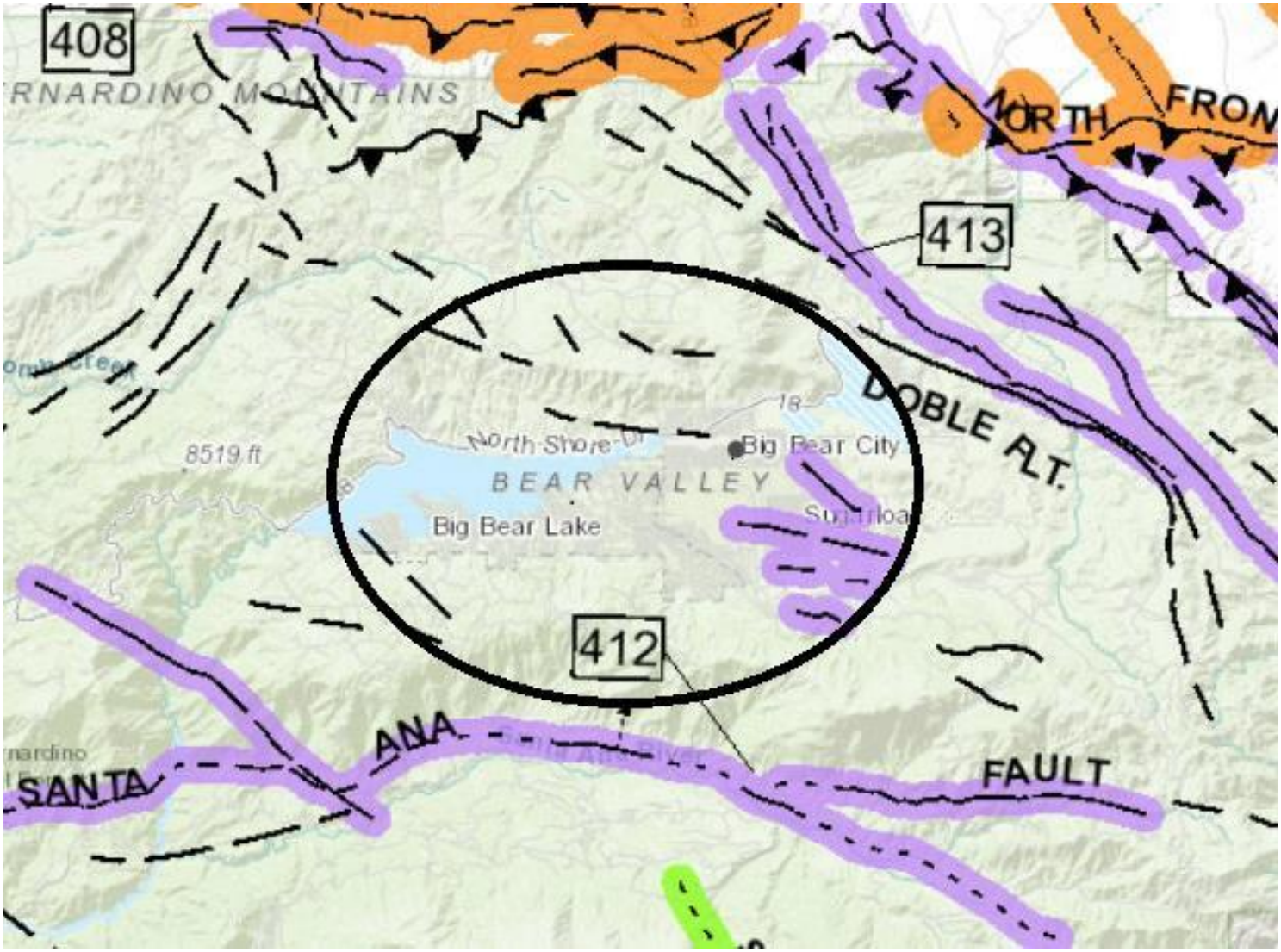
Cecilio, C.B. May, 2008. Probable maximum floods and floods from the 100-yr, 24-hr storm at Bear Valley Dam and Baldwin Lake.

U.S. Army Corps of Engineers [USACE]. June, 1998. HEC-1 Flood Hydrograph Package, User's Manual, The Hydrologic Engineering Center, Davis, California.

City of Big Bear Lake and Big Bear Community Services District

Big Bear Lake and Big Bear Community Services District Earthquake Faults

Source: California Department of Conservation/California Geological Survey 2010 most current map on the website https://maps.conservation.ca.gov/cgs/fam/



Sources: County of San Bernardino 2017 MJLHMP, U.S. Geological Survey https://www.usgs.gov/natural-hazards/earthquake-hazards/science/modified-mercalli-intensity-scale

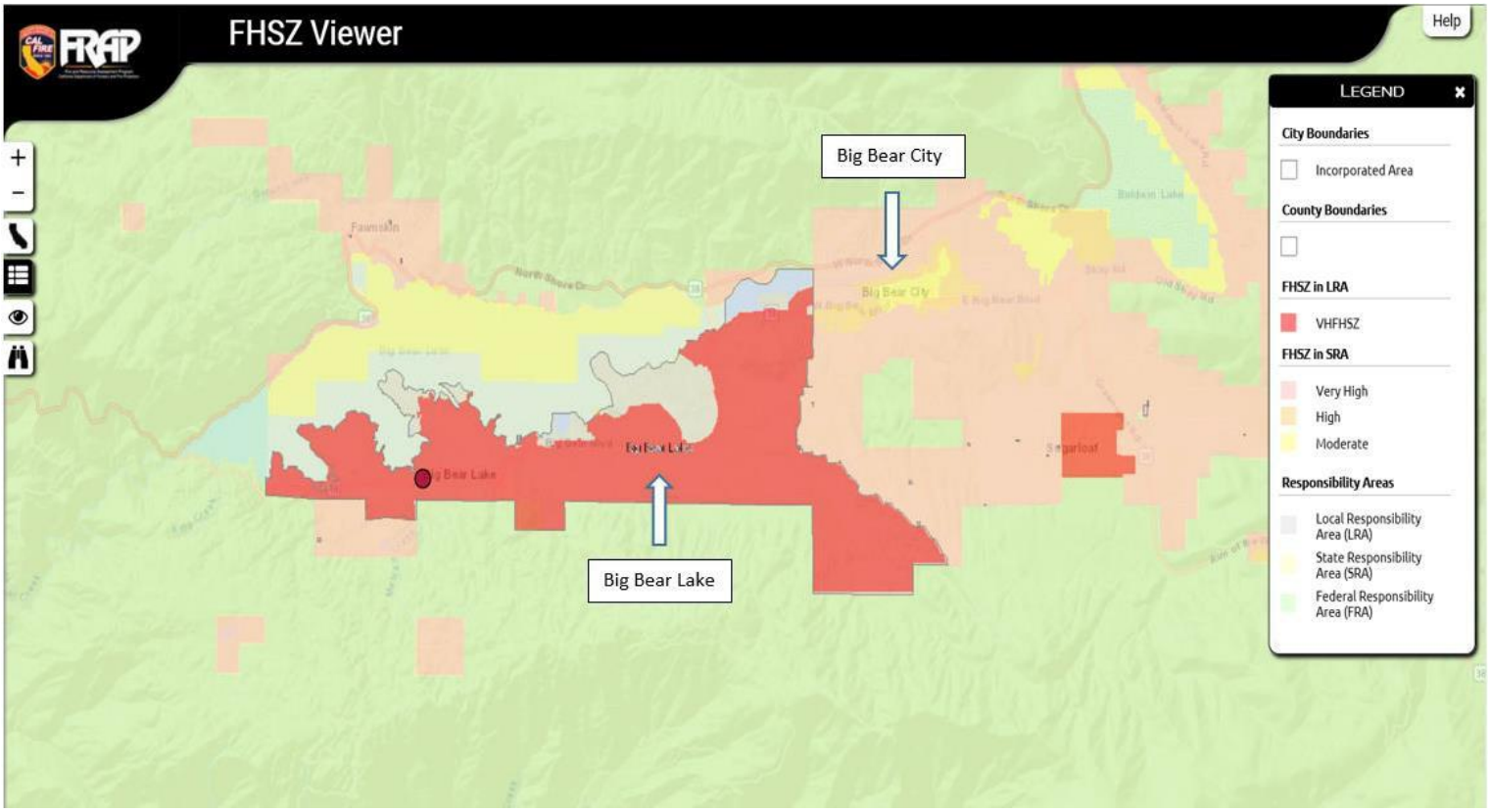
Earthquake Magnitude and Intensity		
Magnitude (M_w)	**Intensity (Modified Mercalli Scale)**	**Description**
1.0 – 3.0	I	I. Not felt except by very few people under especially favorable conditions.
3.0 – 3.9	II – III	II. Felt by a few people, especially those on upper floors of buildings. Suspended objects may swing.
		III. Felt quite noticeably indoors. Many do not recognize it as an earthquake. Standing motorcars may rock slightly.
4.0 – 4.9	IV – V	IV. Felt by many who are indoors; felt by a few outdoors. At night, some awakened. Dishes, windows and doors rattle.
		V. Felt by nearly everyone; many awakened. Some dishes and windows broken; some cracked plaster; unstable objects overturned.
5.0 – 5.9	VI – VII	VI. Felt by everyone; many frightened and run outdoors. Some heavy furniture moved; some fallen plaster or damaged chimneys.
		VII. Most people alarmed and run outside. Damage negligible in well-constructed buildings; considerable damage in poorly constructed buildings.
6.0 – 6.9	VII – IX	VIII. Damage slight in special designed structures; considerable in ordinary buildings; great in poorly built structures. Heavy furniture overturned. Chimneys, monuments, etc. may topple.
		IX. Damage considerable in specially designed structures. Buildings shift from foundations and collapse. Ground cracked. Underground pipes broken.
7.0 and Higher	VIII and Higher	X. Some well-built wooden structures destroyed. Most masonry structures destroyed. Ground badly cracked. Landslides on steep slopes.
		XI. Few, if any, masonry structures remain standing. Railroad rails bent; bridges destroyed. Broad fissure in ground.
		XII. Virtually total destruction. Waves seen on ground. Objects thrown into the air.

Several of the major Southern California faults have a high probability of experiencing a Magnitude 6.7 or greater earthquake within the next 30 years (Figure 4-2); 59% probability of a M6.7 or greater on the Southern San Andreas Fault, 31% probability on the San Jacinto Fault, and 11% probability on the Elsinore Fault. These probabilities were determined by the USGS and CGS in a 2008 study (2007 Working Group on California Earthquake Probabilities, 2008, The Uniform California Earthquake Rupture Forecast, Version 2 (UCERF 2): U.S. Geological Survey Open-File Report 2007-1437 and California Geological Survey Special Report 203 http://pubs.usgs.gov/of/2007/1437/).

Big Bear Lake and Big Bear Community Services District Fire Hazard Severity Zones

The Big Bear Community Services District services the City of Big Bear City.

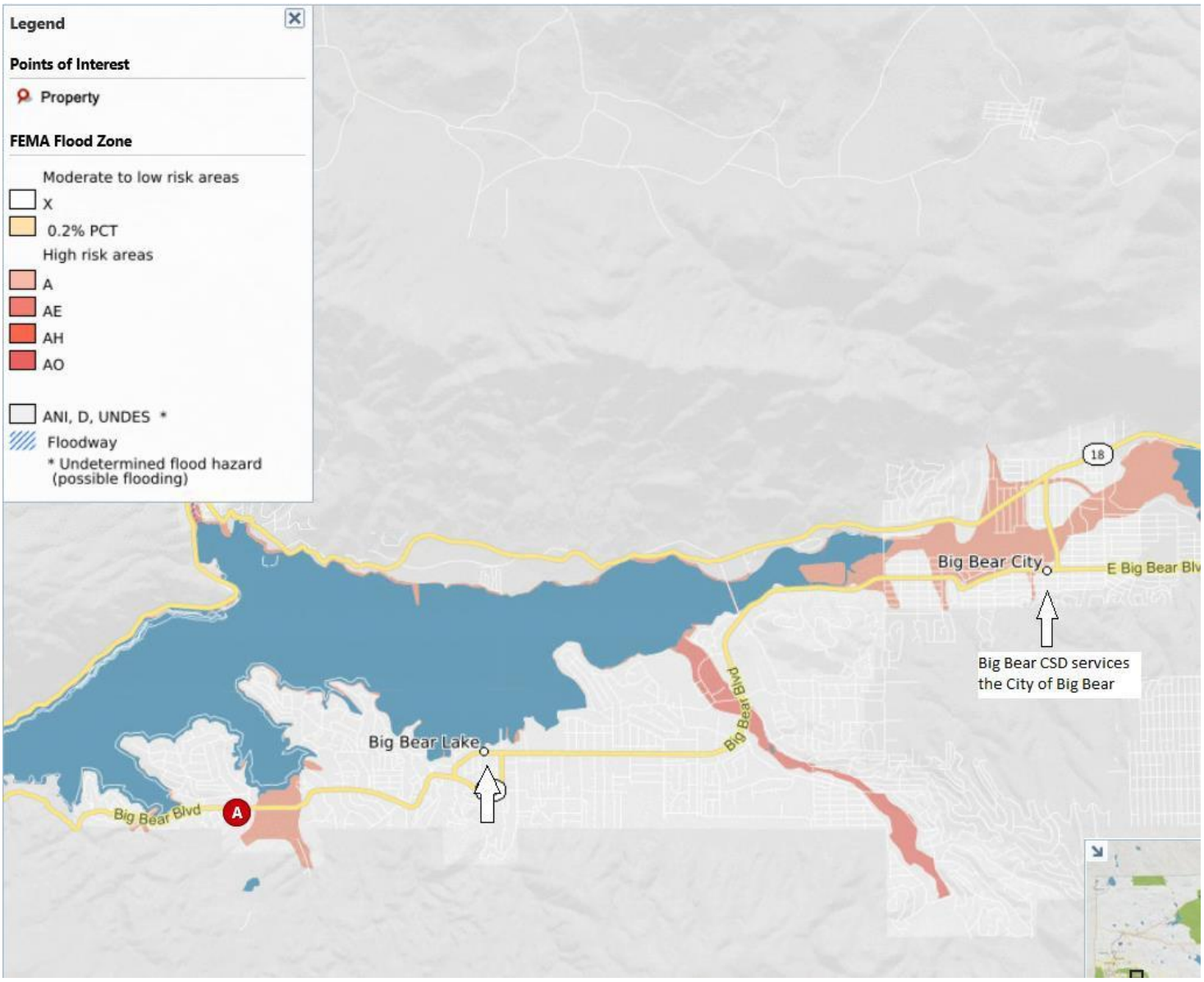
Source: Cal Fire Resource Assessment
Program January 15, 2020



City of Big Bear Lake and Big Bear Community Services District Flood Information

Big Bear Lake and Big Bear Community Services District Flood Zones

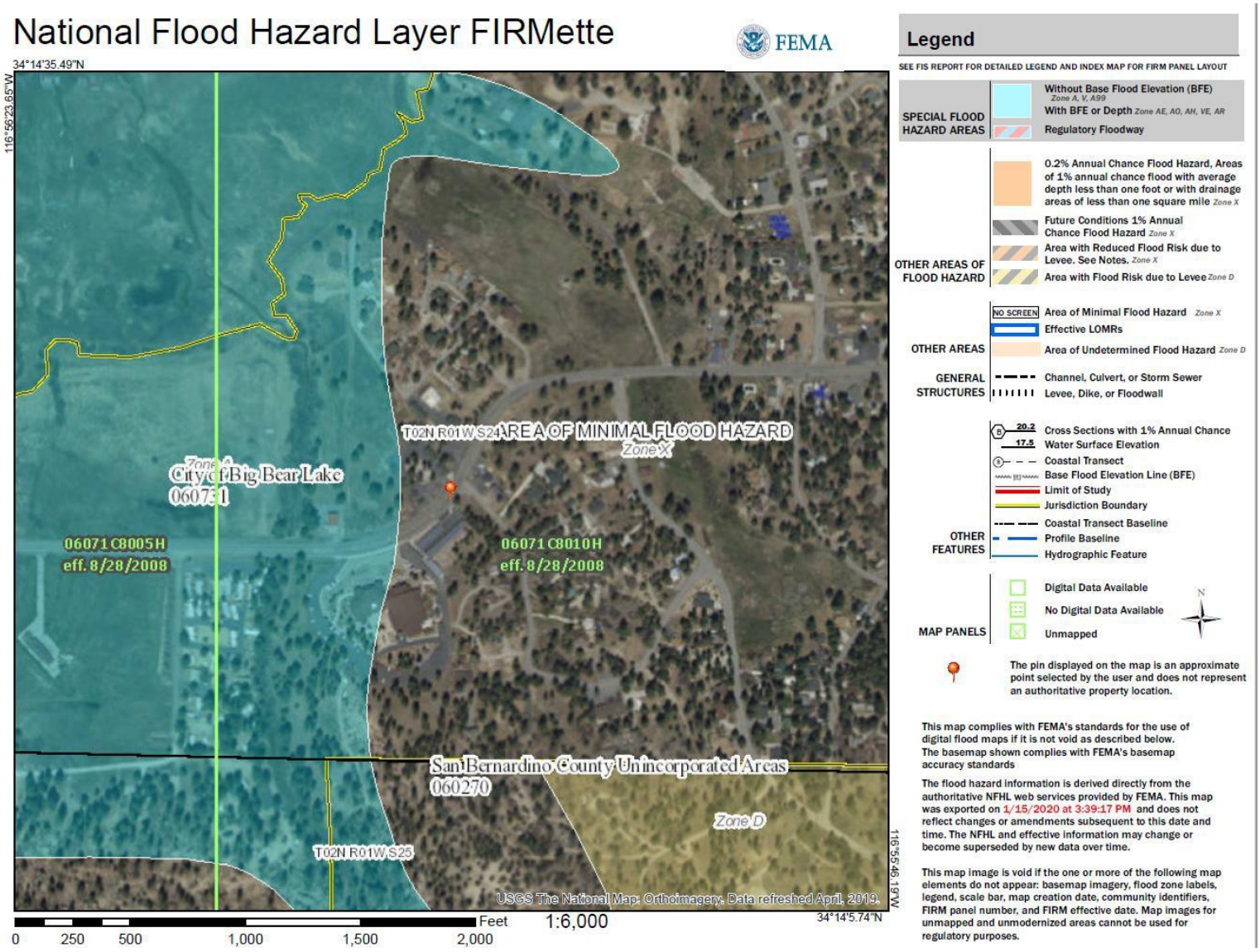
Source: Property Shark.com
https://www.propertyshark.com/mason/ca/San-Bernardino-County/Maps/Fema-Flood-Hazard-Areas



City of Big Bear Lake Flood Zone

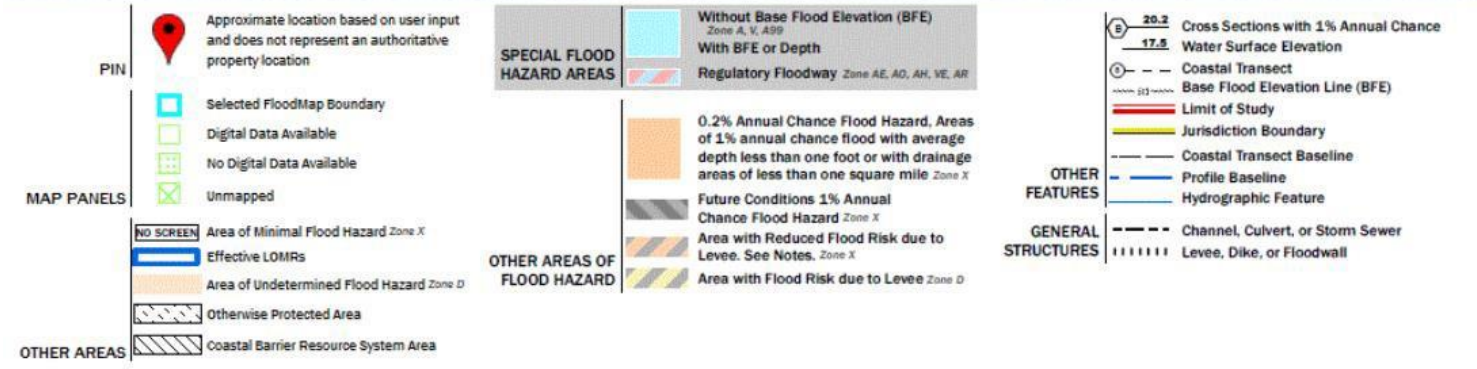
Source: FEMA.gov

https://msc.fema.gov/portal/search#searchresultsanchor



Big Bear Community Services District Flood Zone

Source: FEMA.gov
https://msc.fema.gov/portal/search#searchresultsanchor



Resources and References

Authority - Disaster Mitigation Act of 2000 (DMA 2000), Section 322 (a-d) – Authority Big Bear Municipal Water District Emergency Action Plan

Cal Fire Resource Assessment Program, January 15, 2020 –
Fire Hazard Severity Maps
https://egis.fire.ca.gov/FHSZ/ –

Hazard assessment Earthquake fault maps and descriptions

- California Department of Conservation/California Geological Survey - 2010 (most current) https://maps.conservation.ca.gov/cgs/fam/
- Appendix E - City of Big Bear Lake General Plan (Resolution No. 99-36, 8/23/99) Environmental hazards/geotechnical

Earthquake probability and extent –

- USGS and CGS in a 2008 study (2007 Working Group on California Earthquake Probabilities, 2008, The Uniform California Earthquake Rupture Forecast, Version 2 (UCERF2):
- U.S. Geological Survey Open-File Report2007-1437
- California Geological Survey Special Report 203 http://pubs.usgs.gov/of/2007/1437/).

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FEMA's Local Hazard Mitigation Planning Handbook, March 2013 – Mitigation Action Prioritization.
https://mtmitigation.com/wp-content/uploads/2017/05/fema_local_mitigation_handbook.pdf- Mitigation Strategy

FEMA's Mitigation Ideas – Types of mitigation actions that are relevant to the jurisdictions' hazards and vulnerabilities
https://www.fema.gov/media-library-data/20130726-1904-25045-0186/fema_mitigation_ideas_final508.pdf- Mitigation Strategy

Fire Hazard Severity Map - Cal Fire Resource Assessment Program January 15, 2020

Flood Inundation maps –

- Appendix E - City of Big Bear Lake General Plan (ResolutionNo.99-36,8/23/99) Flooding and Hydrology
- Property Shark.com
  https://www.propertyshark.com/mason/ca/San-Bernardino- County/Maps/Fema-Flood-Hazard-Areas

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National Flood Insurance Information – FEMA NFIP Website

U.S. Census Bureau "Fact Finder" 2013-2017 American Community Survey 5-Year Estimates and statistical information from the 2018 Southern California Association of Governments "Local Profiles Report 2019" specific to the City of Big Bear Lake, and for population information.

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