



Local Hazard Mitigation Plan

CHAPTER I--INTRODUCTION

A. BACKGROUND:

Public Law 106-390, known as the Disaster Mitigation Act of 2000, amended the Robert T. Stafford Disaster Relief and Emergency Services Act. This Act now requires local government to have a Local Hazard Mitigation Plan (LHMP). The LHMP must be approved by the Federal Emergency Management Agency (FEMA), in order for the local government to be eligible to receive federal hazard mitigation project funding after that date.

As a Special District El Dorado Irrigation District (EID) has the option of filing a *stand alone* plan or promulgated as an *addendum* to El Dorado County's (EDC) Plan. EID staff has chosen to pursue the project as an addendum to the El Dorado County Plan.

B. PURPOSE:

The EID LHMP is a planning tool for use by the District in its efforts to reduce future losses from natural and/or man-made hazards. Information within this Plan was compiled by our operational force, input from the general public through frequent and publicized meetings, community involved strategic workshops, newsletters and customer service feedback. Moreover, some information within the Plan was developed through the use of contract personnel and firms specializing in vulnerable assessment programs to eliminate and mitigate potential hazards to District personnel, property, and public exposure.

C. HISTORY:

On October 30, 2000, the President signed into law the Disaster Mitigation Act of 2000 (DMA 2000). The purpose of DMA 2000 is to:

- Establish a national disaster mitigation program that will reduce loss of life and property, human suffering, economic disruption, and disaster assistance costs resulting from disasters, and
- Provide a source of pre-disaster hazard mitigation funding that will assist States and local governments in accomplishing that purpose.

DMA 2000 amends the Robert T. Stafford Disaster Relief and Assistance Act by, among other things, adding a new section, 322 – Mitigation Planning. This places new emphasis on local mitigation planning. *It requires local governments to prepare and adopt jurisdiction-wide hazard mitigation plans as a condition to receiving Hazard Mitigation Grant Program*

(HMGP) project grants/funding. Local governments must review and if necessary, update the mitigation plan annually to continue program eligibility.

- ***Why develop a Mitigation Plan?***

The full cost of the damage resulting from natural hazards – personal suffering, loss of lives, disruption of the economy, and loss of tax base – is difficult to measure. Our county is subject to many types of natural hazards: floods, winter storms, landslides, avalanches, earthquakes, and wildfires, all of which can have significant economic and social impacts. Some, such as winter storms are seasonal and strike in predictable locations. Others, such as wildfires can occur anytime of the year and almost anywhere in the County.

D. SCOPE OF PLAN:

The initial EID LHMP Committee developed the contents of this plan by using the Hazard Mitigation Planning Guide from the Office of Emergency Services.

Step 1 – Form a Committee and Set Hazard Mitigation Goals (June 2004)

The EID Local Hazard Mitigation Committee includes key staff from Health and Safety, Environmental, Water, and Hydro departments.

Step 2 – Identify Hazards (August 2004)

The EID Local Hazard Mitigation committee identified natural hazards which have been known to occur within EID’s geographical range.

Step 3 – Identify Critical Facilities (August 2004)

Step 4 – Identify Existing Mitigation Strategies (September 2004)

Step 5 – Identify the Gaps in Existing Mitigation Strategies (on-going)

Step 6 – Identify Potential Mitigation Strategies (on-going)

Step 7 – Prioritize and Develop the Action Plan (November/December 2004)

Step 8 – Prioritizing Actions (January 2005)

Step 9 – Develop Implementation Strategy (February 2005)

Step 10 – Plan submittal to EDC (February 2005)

CHAPTER II--DISTRICT PROFILE

A. INTRODUCTION

EID is an *irrigation special district* organized in 1925 under the Irrigation District Act (Water Code §§20500, et seq.) and authorizing statutes (Water Code §§22975, et seq.). Its original purpose was to provide domestic water to the City of Placerville and irrigation water to local farmers. Under existing law, this agency provides water, wastewater, recycled water, hydroelectric, and recreation services within its service area, located in the western slope of the Sierra Nevada Mountains in the County of El Dorado, and serves approximately 100,000 customers. EID is an essential support element for fire fighting and it is imperative that our system remains fully operational at all times. Moreover, the U.S. Forest Service has identified 18 communities within El Dorado County that are at greatest risk for disaster level fire storms and we provide the key points of water for fighting and mitigating these wild land fires.

EID owns and operates a 21 megawatt hydroelectric electric generation project licensed by the Federal Energy Regulatory Commission (FERC Project 184) which consists of 4 reservoirs (Echo Lake, Lake Aloha, Caples Lake, and Silver Lake), dams, and approximately 23 miles of flumes, canals, siphons, and tunnels located through the Sierra Nevada Mountains east of Placerville in the Counties of El Dorado, Alpine, and Amador. It is imperative to safe guard and mitigate damage to all dams, reservoirs, and water conveyance systems because a failure could result in significant danger to those persons that reside, work, or play downstream.

Location: The District lies midway between the cities of Sacramento and South Lake Tahoe along the Highway 50 corridor. It is bounded by Sacramento County on the west and the town of Strawberry on the east. The community of El Dorado Hills is the west-most community served by the contiguous water system and Pollock Pines is the east-most. The area north of Coloma and Lotus establishes the northern-most service area. The largely agrarian communities of Pleasant Valley and South Shingle Springs anchor the southern-most service area. The City of Placerville is located in the central part of the District and receives water from the District on a wholesale basis. The District is spread over 226 square miles and is intermixed with low lying savanna topography of rolling hills and ultimately to high Alpine altitudes. See Attachment "A" Map

B. PAST DEVELOPMENT TRENDS

The original water system was a ditch conveyance system. Following many years of effort on the part of early Boards and committed staff to develop additional water supplies, the United States Bureau of Reclamation (USBR) authorized the Sly Park Unit under the American River Act of October 14, 1949 to augment the original water delivery system. The Sly Park Unit included the construction of Sly Park Dam and Reservoir, Camp Creek Diversion Dam and Tunnel, and conduits and canals used to convey, treat, and store water delivered from Sly Park's Jenkinson Lake. The project was completed in 1955, as a non-contiguous part of the Central Valley Project. The Sly Park Unit operated under contract by EID from 1955 until the District purchased the Sly Park Unit from the USBR on December 23, 2003.

The District's other main source of supply is at Folsom Reservoir. The District currently has two USBR water service contracts totaling 7,550 acre-feet and is working on a new 7,500 acre-feet

USBR contract for use in 2005. Additionally, the District was awarded a new water right for 17,000 acre-feet for diversion at Folsom Reservoir by the State Water Resources Control Board.

C. CURRENT DEVELOPMENT TRENDS

Today, the District provides municipal and industrial water (both retail and wholesale), irrigation water, wastewater treatment and re-cycled water, recreation, and hydroelectric services. As such, EID is one of the few California districts that provide the full complement of water-related services in the historical California Gold Rush area. Included in the District are the communities of Cameron Park, Camino, Diamond Springs, El Dorado, El Dorado Hills, Placerville, Pollock Pines, Shingle Springs, Rescue, and many smaller communities.

System Description: The District's contiguous service area spans 226 square miles and ranges from 500 feet at the Sacramento County line to over 8100 feet in elevation in the eastern part of the District. The system requires 181 pressure-regulating zones to operate reliably. The water system operates over 1,150 miles of pipe, 40 miles of ditches, 6 treatment plants, 33 storage reservoirs and 21 pumping stations. In addition, the wastewater system operates 58 lift stations, 300 miles of pipe, and 5 treatment facilities. The El Dorado Hills and the Deer Creek wastewater treatment facilities now produce Title 22 recycled water which is used at golf courses and on front and back yard landscapes in single family homes within selected communities within the District. EID's recycled water program is entering its third decade, and is considered a leader in the recycled water industry in California.

The District also owns and operates Sly Park Recreation Area at its main reservoir, Jenkinson Lake. Located in a heavily wooded area, it is popular for both day visits and overnight camping. The park includes 600 surface acres for water activities, 10 picnic areas, 9 miles of shoreline, 2 boat ramps, and 191 individual campsites. Group camping areas include: 5 adult, 2 youth, 1 handicapped and 1 equestrian. There are also 9 miles of hiking and equestrian trails, and a Native American/historical museum that includes a self-guided, 1/2-mile trail for those who enjoy nature and wildlife viewing.

CHAPTER III--HAZARD RISK ASSESSMENT

A. WHAT ARE THE HAZARDS?

El Dorado County is prone to a variety of natural hazards. In no particular order, these include: flooding, high winds, wildland fires, drought, landslide, avalanche, and severe winter storms. The following list of natural and manmade disasters (and the areas affected by them), either have or could affect future EID operations.

B. DEFINITIONS OF HAZARDS

Flooding: Floods are defined as a temporary overflow of water onto lands that are not normally covered by water. Flooding results from the overflow of major rivers and tributaries, storm surges, and/or inadequate local drainage. Floods can cause loss of life property damage, water supply contamination, and loss of power generation. Floods can also disrupt travel routes on roads and bridges.

Inland floods are most likely to occur in the spring due to the increase in rainfall and melting of snow; however, floods can occur at any time of the year. A sudden thaw in the winter or a major downpour in the summer can cause flooding. This was seen nine years ago when the region was hit by the *Pineapple Express*. This is a warm weather storm system from the southern Pacific Ocean. The storm disburse large amounts of rain in short time period. During the winter months this warm rain also causes rapid melting of snow.

- ***Disaster Event:*** During late 1996 EID experienced a series of strong storms that produced heavy snowfall that extended to lower elevations. Immediately following these colder storms, a wave of sub-tropical (warmer) storms (*Pineapple Express*) struck the area causing accelerated snow melt. The combination resulted in an unprecedented amount of runoff water that inundated streams, lakes and rivers. Reservoirs quickly went to capacity requiring the purposeful release of water downstream. The combination resulted in the flooding of various areas that damaged structures, water conveyance systems, diversion dams, created water contamination, and roadways. The monetary damage amount for this one incident was over \$30 million and resulted in a “Presidential Declared Disaster” area.

High Winds: Significantly high winds occur especially during winter storms and thunderstorms. Falling objects and downed power lines are dangerous risks associated with high winds. In addition, property damage and downed trees are common during high wind occurrences. The risk of “downed” power lines have often resulted in significant wild land fires.

Severe Thunderstorms: All thunderstorms contain lightning. During a lightning discharge, the sudden heating of the air causes it to expand rapidly. After the discharge, the air contracts quickly as it cools back to ambient temperatures. This rapid expansion and contraction of the air causes a shock wave that we hear as thunder, a shock wave that can damage building walls and break glass.

- *Lightning:* A giant spark of electricity that occurs within the atmosphere or between the atmosphere and the ground. As lightning passes through air, it heats the air to a temperature of about 50,000 degrees Fahrenheit, considerably hotter than the surface of the Sun. Lightning strikes can cause death, injury, property damage, and wildfires.

Wildland fires: A forest fire is an uncontrolled fire in a woody area. They often occur during drought and when woody debris on the forest floor is readily available to fuel the fire. Grass fires are uncontrolled fires in grassy areas.

The District's facilities and infrastructure are located within and are adjacent to Federal Lands that have been described by the U.S. Forest Service as being heavily fueled and have the potential for a disaster level fire storm event. The U.S. Forest Service has identified 18 local communities that are at greatest risk for such an event and EID provides water and sewage services to them. Our facilities, infrastructure and personnel are also at risk due to the fire load and terrain setting. A wildfire storm has the potential of destroying power facilities, water delivery & storage, create water contamination, environmental damage and cause potential injury and death to staff. The El Dorado County Fire Safe Council in conjunction with the USFS, California Department of Forestry and local fire districts have assembled a fire vulnerability and mitigation plan for the County and it is included in the El Dorado County Hazard Mitigation Plan. EID has developed a Fire Emergency Response Plan for each of our facilities. It is the intent of this Mitigation Plan, in conjunction with El Dorado County Fire Safe Council's Mitigation Plan to address EID's vulnerabilities and mitigation efforts.

Ice & Snow Events: Ice and snow events typically occur during the winter months and can cause loss of life, property damage, environmental damage and tree damage.

- *Heavy Snow Storms:* A winter storm can range from moderate snow to blizzard conditions. Blizzard conditions are considered blinding wind-driven snow over 35 mph that lasts several days. A severe winter storm deposits four or more inches of snow during a 12-hour period or six inches of snow during a 24-hour period.
- *Ice Storms:* An ice storm involves rain, which freezes upon impact. Ice coating at least one-fourth inch in thickness is heavy enough to damage trees, overhead wires and similar objects. Ice storms also often produce widespread power outages.

Landslides: EID has facilities and water conveyance systems that have been identified as being in geologically active zones. One such zone is located in the American River Canyon straddling Highway 50 running east from Icehouse Road to Strawberry. The State of California CALTRANS geologists conducted a study of the area and identified "600" potential landslide areas. In 1997, and as a result of strong storms, two very large landslides occurred in this area and damaged and incapacitated the system and blocked Highway 50 for 60-days.

- ***Disaster Event:*** In October 2004 a wild land fire started in this area burning 7700 acres of land increasing the potential for debris flows and landslide activity. This added risk increases our vulnerability for substantial damage to facilities and operational systems.

Avalanches: An avalanche is a fall or slide of a large mass of snow, rock, or other material down a mountainside. The prevalent exposure would be in the higher country side and could impact the EID personnel, water conveyance systems and roadways. Heavy snow and rock fall activity has interrupted operations three times during 2004 alone. Flume and canals become inundated with debris. A massive avalanche could potentially damage and interrupt service for extended periods of time.

Earthquakes: Geologic events are often associated with California there are several active and inactive faults within El Dorado County.

- ***Earthquakes:*** A rapid shaking of the earth caused by the breaking and shifting of rock beneath the earth's surface. Earthquakes can cause buildings and bridges to collapse, disrupt gas, electric, phone service, water, recycled water, sewer lines, and often cause landslides, flash floods, fires, and avalanches. Larger earthquakes usually begin with slight tremors but rapidly take the form of one or more violent shocks, and end in vibrations of gradually diminishing force called aftershocks. The underground point of origin of an earthquake is called its focus; the point on the surface directly above the focus is the epicenter. The magnitude and intensity of an earthquake is determined by the use of scales such as the Richter scale.
- Earthquake and shake maps are being obtained from the U.S. Geologic Service and the California Office of Emergency Services, and will be addressed in the next upgrade of the El Dorado County Hazard Mitigation Plan.
- The University of Reno is actively researching the potential threat of a level 6 or 7 earthquake in the Tahoe basin area. More information is available at the university's website (<http://www.seismo.unr.edu/htdocs/WGB/LakeTahoeTsunami/>). We will be reviewing this information further and the potential threat to EID operations and its customers.

Drought: A drought is defined as a long period of abnormally low precipitation, especially one that adversely affects growing or living conditions. The effect of drought is indicated through measurements of soil moisture, groundwater levels and streamflow. However, not all of these indicators will be minimal during a drought. For example, frequent minor rainstorms can replenish the soil moisture without raising groundwater or surface water storage. Low streamflow, groundwater, and surface water storage levels commonly cause diminished water supply.

The El Dorado County has been declared by the U.S. Agricultural Secretary as a drought disaster area. Extended drought periods can result in tremendous economic losses and ultimately our ability to provide vital services to the communities we serve.

We have recognized this serious potential problem and have taken initial steps to mitigate losses by enclosing "open" reservoirs and water conveyance systems.

C. SUMMARY OF VALUES

EID has conducted an assessment of the many Natural Hazards listed above that could impact our facilities and infrastructure*. Insured replacement cost values for structures and contents (as of 2003) are as follows:

| Description | | Building Appraised Insurable Cash Value | Contents Estimated Replacement Cost |
|--|------|---|-------------------------------------|
| District Headquarters - Placerville | | | |
| Dunlop Customer Service Building | | \$3,500,000 | \$600,000 |
| Finance Building | P 2 | 106,695 | 55,000 |
| Board Room | T 5 | 46,293 | 35,000 |
| Administration Annex | T 6 | 25,500 | 20,000 |
| Customer Service Building | P 1 | 313,599 | 277,200 |
| O & M Support | T 9 | 16,875 | 22,500 |
| Water Quality | T 3 | 25,500 | 15,000 |
| Water Quality Shop | T 3A | 10,000 | 5,000 |
| Facilities Management Inspection | T 8 | 25,500 | 9,500 |
| Facilities Management Admin. | T 10 | 46,250 | 45,500 |
| Facilities Management | T 7 | 46,250 | 35,000 |
| Information Systems | T 4 | 25,500 | 55,000 |
| Operations & Maintenance | P 3 | 100,649 | 79,000 |
| Auto & Weld Shop | P 4 | 97,377 | 134,750 |
| Construction & Ditches | P 5 | 27,085 | 12,500 |
| Electronics Repair Shop | T 11 | 3,000 | 23,250 |
| Equipment Storage | P 7 | 10,000 | 26,000 |
| Waste Storage | P 8 | 5,000 | 2,000 |

| | | | |
|---|------|---------|---------|
| Warehouse | P 6 | 87,613 | 77,250 |
| General Services | T 1 | 16,105 | 17,500 |
| General Services Storage | T 12 | 5,368 | 8,800 |
| 6 Backyard Type Storage Sheds | | 12,000 | 25,000 |
| El Dorado Hills Wastewater Treatment Plant | | | |
| Control Building | | 38,116 | 10,300 |
| Chlorine Building | | 12,206 | 25,000 |
| Pump Building | | 19,682 | 0 |
| Warehouse | | 30,534 | 5,500 |
| Lab & Master Control Bldg (1999) | | 233,280 | 110,800 |
| Blower Building (1999) | | 82,080 | 231,000 |
| Digester Control Building (1999) | | 6,480 | 128,000 |
| Dissolved Air Flotation Bldg (1999) | | 25,650 | 184,000 |
| Chemical Feed Building (1999) | | 37,800 | 67,000 |
| Reclaimed Water Pump & Motor Control (1999) | | 15,794 | 175,000 |
| Motor Control Building (1999) | | 5,832 | 70,000 |
| El Dorado Hills Water Treatment Plant – | | | |
| Control Building | | 112,261 | 698,800 |
| Equipment Building | | 219,690 | 23,000 |
| Treated Water Pump Building | | 43,938 | 0 |
| Filter Backwash Pump Building | | 4,524 | 0 |
| Folsom Lake Raw Water Pump Station | | 61,514 | 0 |
| Shingle Springs Booster Pump | | | |
| Pump Building | | 7,205 | 71,000 |
| Generator Building | | 7,845 | 17,500 |
| Sewer Lift Stations | | | |
| Business Park No. 1 | | 17,024 | 11,000 |

| | | |
|---|--------|---------|
| Business Park No. 2 | 17,024 | 6,000 |
| Business Park No. 3 | 17,024 | 6,000 |
| Summit 1 | 50,590 | 12,500 |
| Summit 3 | 16,910 | 11,000 |
| Summit 5 | 16,910 | 10,000 |
| Southpointe | 14,223 | 13,000 |
| Waterford 8 | 23,785 | 11,000 |
| Waterford 9 | 23,785 | 11,000 |
| Timberline Ridge Bldg. 1 | 15,371 | 12,250 |
| Timberline Ridge Bldg. 2 | 1,774 | 1,750 |
| New York Creek | 12,553 | 7,250 |
| Bar J | 8,960 | 11,000 |
| K Mart | 9,624 | 19,500 |
| Office of Education | 12,257 | 11,500 |
| Golf Course Booster Pump | 8,482 | 15,000 |
| Oak Ridge Reservoir | 22,993 | 22,500 |
| SouthPointe Booster Pump Station | 15,390 | 23,000 |
| Bass Lake | | |
| Warehouse and Offices | 88,004 | 21,000 |
| Pump Warehouse | 13,252 | 25,000 |
| Control and Chlorine | 25,725 | 12,500 |
| Pump House | 3,378 | 12,500 |
| | | |
| Deer Creek Wastewater Treatment Plant Cameron Park | | |
| Office and Control | 85,462 | 236,500 |
| Warehouse | 45,893 | 1,500 |
| Upper Blower | 27,891 | 65,000 |
| Upper Pump House | 33,313 | 45,500 |

| | | |
|--|---------|---------|
| Lower Pump House | 22,126 | 0 |
| Back Wash | 17,414 | 11,500 |
| Lower Blower/Main Electrical Controls | 17,897 | 200,000 |
| Reclaimed Water | 44,550 | 139,500 |
| Belt Press Building No. 1 | 75,000 | 300,000 |
| Thickener Control Building | 75,000 | 200,000 |
| Effluent Building | 45,000 | 200,000 |
| Quartz Road Pump House | 4,292 | 2,500 |
| Reservoir 7 Water Treatment Plant | | |
| Water Treatment Building | 33,338 | 47,750 |
| Pressure Reducing Station | 7,197 | 7,500 |
| Sanitation District No. 1 | 33,095 | 22,500 |
| Reservoir No. 2 | 25,251 | 32,000 |
| Moose Hall Reservoir | | |
| Pump House Building | 8,982 | 0 |
| Storage Building | 8,982 | 0 |
| Sportsman's Hall | 13,278 | 50,000 |
| Reservoir No. 1 Water Treatment Plant | | |
| Control and Chlorine | 123,616 | 195,000 |
| Water Treatment Building | 34,609 | 22,500 |
| Gold Ridge Pump Station | 4,247 | 0 |
| Sly Park Recreation Area | | |
| Residence | 53,423 | 0 |
| Residence Garage | 9,066 | 0 |
| Storage Building | 20,065 | 0 |
| Warehouse/Shop/Garage | 57,335 | 0 |
| Office and Storage | 53,906 | 11,000 |
| Gatehouse Entrance | 6,987 | 3,500 |

| | | |
|---|--------------------|--------------------|
| 12 Restrooms (\$10,000 each) | 120,000 | 0 |
| Museum | 4,072 | 11,000 |
| Shop | 49,462 | 11,500 |
| Boat Mooring Facility including slips & docks | 300,000 | |
| Courtesy Docks (3 each, \$12,000 ea) | 36,000 | |
| | | |
| Reservoir A Water Treatment Plant | | |
| Control | 154,733 | 47,000 |
| Filter | 186,662 | 305,000 |
| Raw Water | 23,502 | 130,500 |
| Weber Dam Pump House | 19,931 | 12,000 |
| Swansboro Water System | | |
| Cableview Court Chlorine Station | 2,609 | 3,700 |
| Dogwood Lane Well Building | 2,609 | 3,200 |
| Log Cabin Lane Well Building | 3,679 | 2,500 |
| Outingdale Water Treatment Plant/Tank | 68,921 | 100,250 |
| Strawberry Water Treatment Plant/Tank | 48,600 | 94,000 |
| Texas Hill Rental Properties | | |
| 4331 Big Cut Road | 34,547 | 0 |
| 4300 Sofar Road | 38,652 | 0 |
| 4156 Big Cut Road | 60,188 | 0 |
| 5011 Quarry Road | 46,062 | 0 |
| <u>TOTAL</u> | \$8,139,072 | \$6,198,300 |

B:BCCOV/PINS/10/93(revised 2/03)

*(Note: Values for flumes, canals, tanks, SCADA systems, etc. are under review and will be added to the next Plan update.

CHAPTER IV--THE DISTRICT'S NATURAL HAZARD MITIGATION STRATEGY

Mitigation Goals

The EID Local Hazard Mitigation Plan has identified the *natural* hazards that could impact its operations, staff personnel, local residents, and the public, and has assessed the risks inherent to each hazard.

It is a goal of EID to implement measures that are designed to lessen the effects of natural risks and hazards, and this Mitigation Plan is a means to that end. For example, within its jurisdictional areas, EID works hard to decrease the chance of wild land fires by training internal personnel and (on occasions), *contracting-out* to reduce the fuel load in areas of heavy vegetation. A grant program would add to our ability to abate or mitigate the future potential of wildland fires by increasing prevention activities.

The goals identified in the EID Natural Hazard Mitigation Plan are to:

- Save lives and protect property.
- Reduce impact of future disaster events.
- Enable post-disaster funding.
- Hasten recovery from disasters.
- Demonstrate a dedication to improving the District's Environmental and Safety Programs.

These goals are applicable to all natural hazards identified in this plan. Although broad in scope, their intent, namely to reduce the threat of natural hazards through mitigation approaches, is still quite clear in definition and vision. From these goals come the objectives of El Dorado Irrigation District's Local Hazard Mitigation Plan. The objectives are arranged in a manner that addresses each natural hazard individually. From the goals, objectives are derived, and from the objectives, actions are formulated.

A final set of objectives addresses mitigation measures that are applicable to all natural hazards identified within the Plan.

Prioritizing Mitigation Measures

In order to identify which natural hazards pose the greatest threat to EID operations, the Probability and Risk Assessments from Section III of this plan were scaled and quantified to provide an overall assessment of where the greatest threats from natural hazards lie. From this matrix, an initial measure of the identified natural hazards was calculated. This Probability/Risk Assessment Scoring Matrix provides a fundamentally sound, broad-based foundation from which to build more refined comprehension of natural hazard threats within EID in the future.

Natural Hazard Probability/Risk Assessment Scoring Matrix

| SCALING | NATURAL HAZARD | PROBABILITY | RISK | TOTAL | THREAT |
|-------------------|----------------|-------------|------|-------|-----------|
| Very Low = 1 | Dam Failure* | 2 | 2 | 4 | Very Low |
| Low = 2 | Avalanche | 2 | 1 | 3 | |
| Moderate Low =3 | Drought | 4 | 3 | 7 | |
| Moderate = 4 | Earthquake | 5 | 4 | 9 | |
| Moderate/High = 5 | Landslide | 5 | 4 | 9 | |
| High = 6 | Flood | 5 | 4 | 9 | |
| Very High = 7 | Severe Storm | 4 | 3 | 7 | |
| | Wildland Fire | 6 | 5 | 11 | Very High |

*Probability/Risk can vary depending upon age and configuration

Mitigation Objectives

The following is a list of objectives developed in conjunction with the overall goals of this plan. Within each objective, one or more actions designed to facilitate the realization of the objective are identified. The objectives are sorted by specific natural hazards and are arranged in the order of priority identified in the Natural Hazard Rating Table. The highest priority objectives and actions are listed first, with the lowest priority objectives and actions listed last.

WILDLAND FIRES

Objective #1: Minimize the threat to lives and property posed by the possibility of wildland fire within EID boundaries.

Action 1.1: Reduce fuel loading within identified District areas subject to wildland fires.

Timeframe: On-going.

Funding: Funding required.

Staff: Individual property owners, ED County Fire Safe Council, the California Conservation Corp, U.S. Forest Service, and affected government agencies.

Action 1.2: Identify fire prone areas surrounding established facilities within the District with strong potential for fires. Develop partnerships with County Fire and adjacent neighbors to institute weed/brush abatement around/near EID facilities.

Timeframe: On-going.

Funding: Funding required.

Staff: ED County's Fire Safe Council.

Action 1.3: County fire requires road re-construction to facilitate emergency vehicle ingress and egress. (i.e., road to be widened at DCWWTP)

Timeframe: Ongoing

Funding: Funding required.

Staff: Contract personnel

EARTHQUAKES

Objective #2: Minimize the threat to lives and property as a result of a possible earthquake with the El Dorado County region.

Action 2.1: Hire contract personnel to ensure the construction features of existing structures are seismically safe buildings and meet State Building and Fire Codes.

Timeframe: 2 years.

Funding: Funding required.

Staff: Building Department.

Action 2.2: Inspect all District buildings and, where applicable, upgrade structures to withstand earthquake events.

Timeframe: Ongoing.

Funding: Funding required.

Staff: Outside contract specialists

Action 2.3: Develop and distribute an employee guide to earthquake preparedness techniques.

Timeframe: 1.5 years.

Funding: Funding required.

Staff: To be determined

SEVERE STORMS

Objective #3: Lessen storm related damage for all types of severe storms that impact EID.

Action 3.1: Review County ordinance to facilitate adequate snow storage and drainage easements. Petition to correct as necessary.

Timeframe: 1 year.

Funding: Funding required.

Staff: Hydro-electric; Drinking Water; Outside contractor

FLOODS

Objective #4: Minimize the threat to lives and property posed by the possibility of flood within the District jurisdiction.

Action 4.1: Review recognized flood-prone areas and match to exposures of personnel, facilities and equipment.

Timeframe: 1 year.

Funding: No funding required at this time.

Staff: Planning Department.

Action 4.2: Work with County to ensure that all bridges within District jurisdiction are structurally safe from failure during peak flow scenarios.

Timeframe: 1 year.

Funding: Funding may be required.

Staff: Outside Support: County Fire; Public Works Department; California Department of Transportation.

Action 4.3: Stockpile pumps, sandbags and related equipment in order to ensure an adequate supply to combat erosion during flood events. Develop a quick response team.

Timeframe: Ongoing.

Funding: Funding required.
Staff: To be determined

LANDSLIDES

Objective #5: Reduce landslide events and overall soil erosion within District property jurisdiction.

Action 5.1: As part of District *road maintenance*, inspect road cuts and fills for signs of slope failure. Stabilize slopes as necessary.

Timeframe: On-going.

Funding: Funding may be required.

Staff: Internal work crews

Action 5.2: Identify questionable hillsides. Construct “rock pens” and drill & anchor points, and provide cut and fill techniques for finished slopes at the angle of repose.

Timeframe: 3 years.

Funding: Funding required.

Staff: Internal and external support

Action 5.3: Work with County to identify grading ordinance, ensure that all disturbed slopes are re-vegetated after grading to reduce erosion potential while promoting slope stabilization.

Timeframe: On-going

Funding: Funding required

Staff: Internal/external

DROUGHT

Objective #6: Minimize the threat to property posed by the possibility of drought within El Dorado County.

Action 6.1: Develop and distribute a homeowner’s guide to water conservation techniques.

Timeframe: 1 year.

Funding: Additional funding may be required.

Staff: District Customer Service Department.

Action 6.2: Construct additional “closed” water reservoirs to for growing customer base.

Timeframe: On-going

Funding: Funding required

Staff: Internal/external

AVALANCHE

Objective #7: Improve techniques of informing workers and the public on the level of avalanche danger within the District’s backcountry regions in order to diminish the threat to lives and property posed by the potential for avalanche.

Action 7.1: Obtain equipment to monitor avalanche warning information systems that will inform and warn backcountry users of the current level of snow and rock avalanche danger.

Timeframe: 2 years.

Funding: Funding source required.

Staff: Sheriff's Office.

Action 7.2: Construct "rock pens" and drill & anchor points, and provide cut and fill techniques for potential areas of concern.

Timeframe: 2 years.

Funding: Funding required.

Staff: Internal and external support

Action 7.3: Educate District personnel on cold weather survival, skis and snowshoe travel.

Timeframe: On-going.

Funding: Funding required.

Staff: Cold weather survival school and ski resort personnel.

Action 7.4: Train additional personnel in the safe operation of the Districts Snow Cat vehicles and become a "mutual aid" resource.

Funding: Funding required.

Staff: Vendor.

Implementing Mitigation Strategies

Many mitigation measures are preexisting functional strategies. The actions listed above are included as a means of reinforcing those current hazard mitigation efforts. Some may be linked to jurisdictionally specific codes and ordinances or to existing plans under the El Dorado County Plan. In all cases, the EID Hazard Mitigation Plan seeks to function in harmony with and as an enhancement to preexisting plans, ordinance, rules and regulations.

Where mitigating actions are new and not a part of any preexisting governmental or organizational decree, the implementation of these action strategies will be contingent upon the necessary approvals from the appropriate governmental bodies and the securing of necessary funding from yet to be determined sources. Generally speaking, EID has only limited funding available for natural hazard mitigation. Thus, EID will look to secure federal and state natural hazard mitigation grant funding in an effort toward implementing mitigation strategies. We plan on consulting the comprehensive list of federal mitigation programs, activities, and initiatives online through the Federal Emergency Management Agency's website (accessed at <http://www.fema.gov/doc/fima/fmpai>.)

A primary emphasis will be placed upon implementing actions that provide the highest cost-to-benefit ratio. Knowing that funding is an ever-present issue, all effort will be given to identify actions most beneficial to the citizens and property within the County. The greatest natural hazard threat to lives and property is wildland fire. Wildland fire is the highest-scoring natural hazard threat in the Natural Hazard Probability / Risk Assessment Scoring Matrix. Therefore, it is clearly indicated that mitigation actions focused toward reducing the threat of wildland fires in the District have the greatest cost-to-benefits ratios and will provide the greatest mitigative relief in everyone's interest.

Plan Maintenance

At a minimum, EID's Local Hazard Mitigation Plan will be evaluated every year to ascertain its continued effectiveness. As part of this evaluation, the overall effectiveness of the plan will be considered in context to:

- Assess the number of natural hazard mitigation projects effectively completed
- Review the number of mitigation projects currently in progress, and
- Consider the success of related programs and activities associated with the plan.

Additionally within these annual evaluations, natural hazard mitigation strategies will be examined for a continued level of appropriateness in relationship to any changes in land uses or the level of intensity associated with prevailing land uses. Participants of the plan may be asked to provide an annual evaluation report of the status of natural hazard mitigation efforts within their respective jurisdictions.

Whenever the annual evaluation indicates a necessity to update the plan, an update of the plan will be initiated. Regardless of the plan's status, a mandatory update to EID's Plan will occur every five years in conjunction with the annual plan evaluation process.

Responsibility for organizing annual and all Plan updates/reviews will fall to the District's Safety Manager and Funding Analysis Departments, and will take responsibility for agendaing and noticing all action related to our plan review or update. Timing will be coordinated with the El Dorado County Office of Emergency Services (OES). The OES will be the determining body when assessing the need for any plan update in excess of the fixed five-year update period.

EID is committed to public involvement within this hazard mitigation plan. For both the plan review evaluation and update, a public hearing may be held by the EID Board. The hearing will be publicized and the public will be asked for comment concerning the plan.

In conjunction with El Dorado County, EID will strive to continue to develop our Local Plan as an outstanding planning tool, helping the citizens and customers of the El Dorado Irrigation District to create a safer place to live, work, and play.

ATTACHMENT "A"

DISTRICT BOUNDARY MAP (Next Page)

Plan Submitted by: Mike Bristow, EID Safety/Security Manager