

## Annex L Lake Oroville Area Public Utility District

### L.1 Introduction

This Annex details the hazard mitigation planning elements specific to the Lake Oroville Area Public Utility District (LOAPUD or District), a new participating jurisdiction to the 2014 Butte County Local Hazard Mitigation Plan (LHMP) Update. This Annex is not intended to be a standalone document but appends to and supplements the information contained in the Base Plan document. As such, all sections of the Base Plan, including the planning process and other procedural requirements apply to and were met by the District. This Annex provides additional information specific to LOAPUD, with a focus on providing additional details on the risk assessment and mitigation strategy for the District.

### L.2 Planning Process

As described above, LOAPUD followed the planning process detailed in Chapter 3 of the Base Plan. In addition to providing representation on the Butte County Hazard Mitigation Planning Committee (HMPC), the District formulated their own internal planning team to support the broader planning process requirements. Internal planning participants, their positions, and how they participated in the planning process are shown in Table L-1. Additional details on plan participation and LOAPUD representatives are included in Appendix A.

*Table L-1 Lake Oroville Area Public Utility District Planning Team*

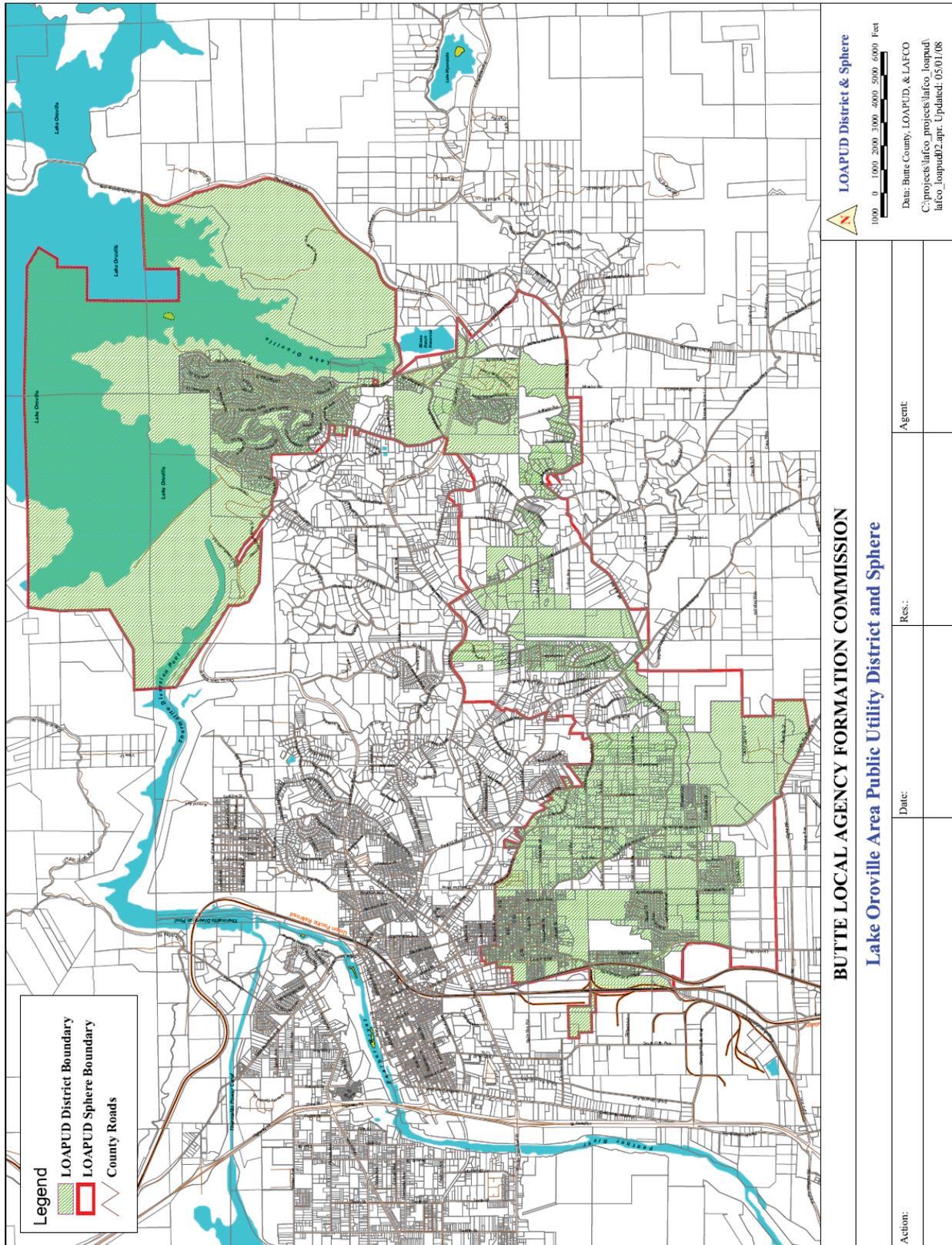
Name	Position/Title	How Participated
Scott McCutcheon	General Manager	Provided hazard identification table, provided hazard input, provided input on capabilities. Attended meetings. Reviewed Plan drafts.
Dan Sanders	Field Operations Supervisor	Provided input on capabilities. Attended meetings. Reviewed Plan drafts.
Cindy Quigley	Clerk of the Board	Provided input. Reviewed Plan drafts.
Darin Kahalekulu	Office Clerk	Provided input. Reviewed Plan drafts.
Keith Knibb	District Engineer	Provided input. Reviewed Plan drafts.

Source: LOAPUD

### L.3 District Profile

The community profile for the District is detailed in the following sections. Figure L-1 displays a map and the location of LOAPUD within Butte County.

Figure L-1 Lake Oroville Area Public Utility District



### **L.3.1. Overview and Background**

It was 1937 when a group of citizens in the "Southside" area of Oroville became concerned with the deplorable conditions of the existing sanitary disposal system. The group petitioned the Board of Supervisors to call a special election for the formation of the "North Burbank Sanitary District" which would allow the construction of a new sewer system. Although the issue received wide support, a legal technicality regarding the Board hearings shut down their first efforts.

Later, the same residents reorganized with a more encompassing visionary plan. This time they petitioned the same Board of Supervisors not for a sanitary district, but for the broader "North Burbank Public Utility District." This would allow them to operate their own water, gas, electricity or garbage collection services if they chose to in the future. On June 7, 1938, with 295 votes in favor and 39 opposed, the citizens had chosen to form a new public utility district.

After its formation, the original District (encompassing 272 acres) provided sanitary sewer collection and treatment services for roughly 350 residences of the Southside of Oroville. The cost of the new system was approximately \$72,000, half of which was contributed by the Work Progress Administration (WPA).

The North Burbank PUD name had been chosen because Burbank School was the center of activity for the Southside area, and due to the fact that there was a Burbank in Southern California they elected to call it North Burbank. The Burbank School was torn down in 1975 and no longer a landmark. Fifty years after its beginning General Manager Mike Glaze changed the district name to Lake Oroville Area Public Utility District as part of the 50th anniversary celebration, the name would better describe the entire area served.

The District is now approaching its 82nd year and has grown to over 3,500 acres, servicing approximately 4,500 customers for sewer collection only. Sewage treatment is under the jurisdiction of the Sewerage Commission-Oroville Region (SC-OR) which was created in 1971 under a Joint Powers Agreement between the District and two other member entities: the City of Oroville and Thermalito Water and Sewer District.

## **L.4 Hazard Identification**

LOAPUD's planning team identified the hazards that affect LOAPUD and summarized their location, extent, frequency of occurrence, potential magnitude, and significance specific to the District (see Table L-2).

**Table L-2 Lake Oroville Area Public Utility District – Hazard Identification Assessment**

Hazard	Geographic Extent	Probability of Future Occurrences	Magnitude/Severity	Significance	Climate Change Influence
Climate Change	Extensive	Likely	Limited	Low	–
Dam Failure	Significant	Unlikely	Catastrophic	Low	Medium
Drought & Water shortage	Limited	Occasional	Negligible	Low	High
Earthquake	Significant	Occasional	Critical	Low	Low
Floods: 100/200/500 year	Limited	Occasional	Limited	Medium	Medium
Floods: Localized Stormwater	Limited	Highly Likely	Negligible	Medium	Medium
Hazardous Materials Transportation	Limited	Occasional	Negligible	Low	Low
Invasive Species: Aquatic	Limited	Occasional	Negligible	Low	Medium
Invasive Species: Pests/Plants	Significant	Likely	Negligible	Low	Low
Landslide, Mudslide, and Debris Flow	Significant	Likely	Negligible	Low	Low
Levee Failure	Limited	Occasional	Negligible	Low	Medium
Severe Weather: Extreme Heat	Limited	Unlikely	Negligible	Low	Low
Severe Weather: Freeze and Winter Storm	Extensive	Highly Likely	Limited	Medium	Medium
Severe Weather: Heavy Rain and Storms (Hail, Lightning)	Limited	Likely	Limited	Medium	Medium
Severe Weather: Wind and Tornado	Extensive	Highly Likely	Limited	Medium	Medium
Stream Bank Erosion	Extensive	Likely	Limited	Low	Medium
Volcano	Limited	Occasional	Negligible	Low	Medium
Wildfire	Extensive	Highly Likely	Catastrophic	Medium	High
<p><b>Geographic Extent</b>                      Limited: Less than 10% of planning area                      Significant: 10-50% of planning area                      Extensive: 50-100% of planning area</p> <p><b>Probability of Future Occurrences</b>                      Highly Likely: Near 100% chance of occurrence in next year, or happens every year.                      Likely: Between 10 and 100% chance of occurrence in next year, or has a recurrence interval of 10 years or less.                      Occasional: Between 1 and 10% chance of occurrence in the next year, or has a recurrence interval of 11 to 100 years.                      Unlikely: Less than 1% chance of occurrence in next 100 years, or has a recurrence interval of greater than every 100 years.</p> <p><b>Magnitude/Severity</b>                      Catastrophic—More than 50 percent of property severely damaged; shutdown of facilities for more than 30 days; and/or multiple deaths                      Critical—25-50 percent of property severely damaged; shutdown of facilities for at least two weeks; and/or injuries and/or illnesses result in permanent disability                      Limited—10-25 percent of property severely damaged; shutdown of facilities for more than a week; and/or injuries/illnesses treatable do not result in permanent disability                      Negligible—Less than 10 percent of property severely damaged, shutdown of facilities and services for less than 24 hours; and/or injuries/illnesses treatable with first aid</p> <p><b>Significance</b>                      Low: minimal potential impact                      Medium: moderate potential impact                      High: widespread potential impact</p> <p><b>Climate Change Impact:</b>                      Low: Not likely to increase the probability of this hazard.                      Medium: Is likely to increase the probability of this hazard.                      High: Is very likely to increase the probability of this hazard.</p>					

## L.5 Hazard Profile and Vulnerability Assessment

The intent of this section is to profile LOAPUD's hazards and assess the District's vulnerability separate from that of the Planning Area as a whole, which has already been assessed in Sections 4.2 Hazard Profiles and 4.3 Vulnerability Assessment in the Base Plan. The hazard profiles in the Base Plan discuss overall impacts to the Planning Area and describe the hazard problem description, hazard extent, magnitude/severity, previous occurrences of hazard events and the likelihood of future occurrences. Hazard profile information specific to LOAPUD is included in this Annex. This vulnerability assessment analyzes the property and other assets at risk to hazards ranked of medium or high significance specific to the District. For more information about how hazards affect the County as a whole, see Chapter 4 Risk Assessment in the Base Plan.

### L.5.1. Hazard Profiles

Each hazard vulnerability assessment in Section L.5.3, includes a hazard profile/problem description as to how each medium or high significant hazard affects LOAPUD and includes information on past hazard occurrences. The intent of this section is to provide jurisdictional specific information on hazards and further describe how the hazards and risks differ across the Planning Area.

### L.5.2. Vulnerability Assessment and Assets at Risk

This section identifies LOAPUD's total assets at risk, including values at risk, populations at risk, critical facilities and infrastructure, natural resources, and historic and cultural resources. Growth and development trends are also presented for LOAPUD. This data is not hazard specific but is representative of total assets at risk within the District.

#### *Assets at Risk and Critical Facilities*

This section considers LOAPUD's assets at risk, with a focus on key District assets such as critical facilities, infrastructure, and other District assets and their values. With respect to District assets, the majority of these assets are considered critical facilities as defined for this Plan. Critical facilities are defined for this Plan as:

*Any facility, including without limitation, a structure, infrastructure, property, equipment or service, that if adversely affected during a hazard event may result in severe consequences to public health and safety or interrupt essential services and operations for the community at any time before, during and after the hazard event.*

Table L-3 lists critical facilities and other District assets identified by the LOAPUD planning team as important to protect in the event of a disaster. LOAPUD's physical assets, valued at over \$22 million, consist of the buildings and infrastructure to support LOAPUD's operations.

*Table L-3 Lake Oroville Area Public Utility District Critical Facilities, Infrastructure, and Other District Assets*

Name of Asset	Facility Type	Replacement Value	Hazard Info
Piping, Manholes, Lampholes, Cleanouts Subsurface Lines	Subsurface Lines	\$13,865,710.00	Flooding, Earthquake, Wildfire, Severe Weather, Dam Failure
Office Buildings, Maintenance Buildings, Etc.	General Admin and Plant Facility	\$3,755,971.00	Flooding, Earthquake, Wildfire, Dam Failure, Severe Weather, Power Outages
Pump Stations	Collection Facility	\$4,434,824.00	Flooding, Earthquake, Wildfire, Dam Failure, Severe Weather, Power Outages,
<b>Total</b>		<b>\$22,056,505.00</b>	

Source: LOAPUD

### *Natural Resources*

LOAPUD has a variety of natural resources of value to the District. These natural resources parallel that of the Oroville area. Information can be found in Section 4.3.1 of the Base Plan and in Section D.5.2 of the Oroville Annex.

### *Historic and Cultural Resources*

LOAPUD has a variety of historic and cultural resources of value to the District. These historic and cultural resources parallels that of the Oroville area. Information can be found in Section 4.3.1 of the Base Plan and in Section D.5.2 of the Oroville Annex.

### *Growth and Development Trends*

Land uses within LOAPUD are primarily medium-high-density residential uses such as the Kelly Ridge and South Oroville areas, although low density residential uses are also found in certain parts of the District. Commercial and industrial uses in the district are found primarily along major roads, such as Olive Highway (SR 162), Lincoln Boulevard, and Lower Wyandotte Road. Two casinos (Feather Falls Casino and Lodge, which is located near the intersection of Lower Wyandotte Road and Ophir Road, and the Gold Country Casino and Hotel on Olive Highway) are located within LOAPUD’s service area and utilize LOAPUD services. Both of the casinos are under federal trust status. A large portion of LOAPUD’s service area is within the state-owned Lake Oroville State Recreation Area, which includes several marinas, campgrounds, and a visitor’s center.

Some of the parcels within LOAPUD’s boundaries utilize individual, on-site septic systems for sewage disposal. It is not known how many parcels in LOAPUD utilize septic systems. LOAPUD’s Sphere of Influence was updated and adopted in July of 2013. Population growth likely mirrors that of Oroville. District expansion is driven by service connections. Growth has been slow at less than 1% per year.

## Future Development

LOAPUD has no control over future development in areas serviced by the District. More general information on growth and development in the Oroville area can be found in Section D.5.2 of the Oroville Annex. The District is limited to the growth generated by developments and requests for service. All growth and development is regulated by the County General Plan or City of Oroville General Plan. Geographically, the District is well positioned to be a factor in future growth.

### L.5.3. Vulnerability to Specific Hazards

This section provides the vulnerability assessment for those hazards identified above in Table L-2 as high or medium significance hazards. Impacts of past events and vulnerability of the District to specific hazards are further discussed below (see Section 4.1 Hazard Identification in the Base Plan for more detailed information about these hazards and their impacts on the Butte County Planning Area).

An estimate of the vulnerability of the District to each identified priority hazard, in addition to the estimate of risk of future occurrence, is provided in each of the hazard-specific sections that follow. Vulnerability is measured in general, qualitative terms and is a summary of the potential impact based on past occurrences, spatial extent, and damage and casualty potential. It is categorized into the following classifications:

- **Extremely Low**—The occurrence and potential cost of damage to life and property is very minimal to nonexistent.
- **Low**—Minimal potential impact. The occurrence and potential cost of damage to life and property is minimal.
- **Medium**—Moderate potential impact. This ranking carries a moderate threat level to the general population and/or built environment. Here the potential damage is more isolated and less costly than a more widespread disaster.
- **High**—Widespread potential impact. This ranking carries a high threat to the general population and/or built environment. The potential for damage is widespread. Hazards in this category may have occurred in the past.
- **Extremely High**—Very widespread with catastrophic impact.

#### *Flood: 100-/500-Year*

**Likelihood of Future Occurrence**—Occasional/Unlikely

**Vulnerability**—Medium

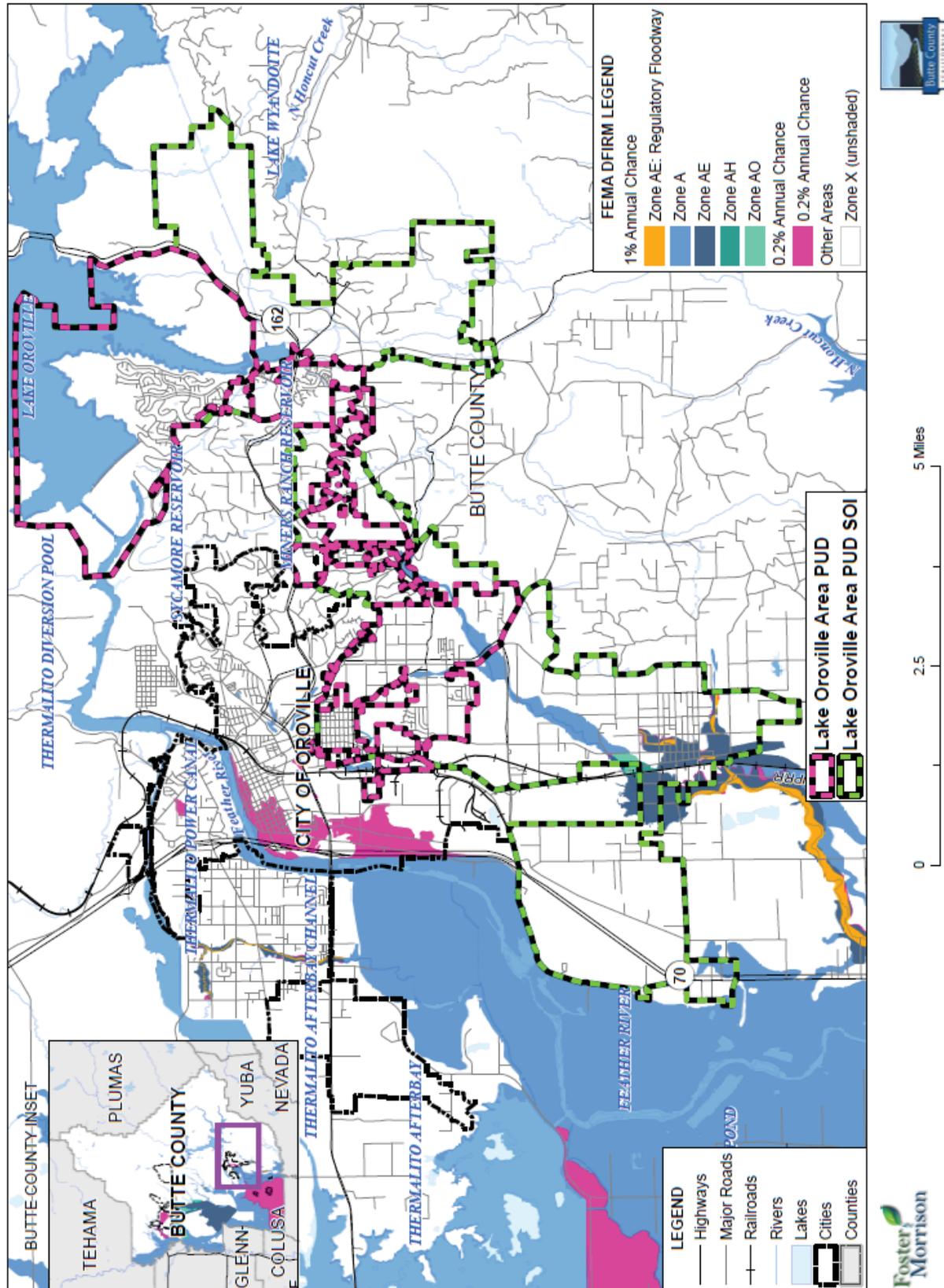
#### Hazard Profile and Problem Description

As previously described in Section 4.2.11 of the Base Plan, areas of the City of Oroville and portions of the District have been subject to historical flooding. The area is traversed by several stream systems and is at risk to the 1% annual chance floods.

## Location and Extent

Areas of the LOAPUD fall in the 1% annual chance floodplains. These areas of the District and its flood zones are shown on Figure L-2.

Figure L-2 LOAPUD – DFIRM Flood Zones



Flood extents can be measured by flood zones and in depths of flooding. Expected flood depths in the District vary, depending on the nature and extent of a flood event; specific depths are unknown. Flood durations in the District tend to be short to medium term, or until either the storm drainage system can catch up or flood waters move downstream. Flooding in the District tends to have a shorter speed of onset, due to the amount of water that flows through the District.

### **Past Occurrences**

The LOAPUD noted recent events that caused disruptions or damages in the District. Specific damages to the District were minimal during the following events:

- March 2016 Rain Event
- December 2016-February 2017 Rain Event
- February 2017 Dam Crisis – While there were no physical damages, there was a loss of 3 business days for administrative functions and even more for some operations facilities.

### **Vulnerability and Impacts from Flood**

Floods can cause substantial damage to structures, landscapes, and utilities as well as life safety issues. Floodwaters can transport large objects downstream which can damage or remove stationary structures. Ground saturation can result in instability, collapse, or other damage. Objects can also be buried or destroyed through sediment deposition. Floodwaters can also break utility lines and interrupt services. Standing water can cause damage to crops, roads, foundations, and electrical circuits.

Flooding has occurred both within the 1% and 0.2% annual chance floodplains and in other localized areas. Impacts to the LOAPUD from flooding can result in property damage, environmental, and economic impacts to the District.

Flooding can also cause severe inflow and infiltration issues within the sewer system. When the sewer system becomes inundated with surface water, capacity issues often arise. Pump stations can be maxed out and cause sewer overflows.

### **Assets at Risk**

Subsurface lines and appurtenances, pump stations, admin and plant operations structures.

### **Future Development**

Newer construction materials create opportunities for added robustness and should be evaluated for implementation in flood prone areas as funding permits.

### ***Floods: Localized Stormwater***

**Likelihood of Future Occurrence**–Highly Likely

**Vulnerability**–Medium

## Hazard Profile and Problem Description

Localized flooding and other issues caused by severe weather events, primarily heavy rains and severe storms, are an annual occurrence in the District. Normally storm floodwaters are kept within defined limits by a variety of storm drainage and flood control measures. Occasionally, extended heavy rains result in floodwaters that overwhelm the drainage system. Primary concerns include impacts to LOAPUD facilities and infrastructure that may affect District operations and possibly causing either a disruption in service or uncontrolled discharges of untreated sewage into surface waters. Other localized flooding concerns include impacts to the roadways and bridges that provides a means of ingress and egress throughout the District.

### Location and Extent

LOAPUD and the nearby City of Oroville and County areas are subject to localized flooding. Specific areas the District is concerned with are shown on Table L-4.

*Table L-4 Lake Oroville Area Public Utility District – Localized Flooding Areas*

Road/Area Name	Flooding	Pavement Deterioration	Washouts	High Water/Creek Crossing	Landslides/Mudslides	Debris	Downed Trees
Las Plumas X Crest Ridge	Y	N					
West of Lincoln to RR	Y	N/A		Y			

Source: LOAPUD

The extent of localized flooding is usually measured in volume, velocity, and depths of flooding. Expected flood depths in the District vary by location. Flood durations in the District tend to be short to medium term, or until either the storm drainage system can catch up or flood waters move downstream. Localized flooding in the District tends to have a shorter speed of onset, especially when antecedent rainfall has soaked the ground and reduced its capacity to absorb additional moisture.

### Past Occurrences

The District noted recent events that caused disruptions or damages in the District. Specific damages to the District were minimal during the following events:

- March 2016 Rain Event
- December 2016-February 2017 Rain Event
- February 2017 Dam Crisis – While there were no physical damages, there was a loss of 3 business days for administrative functions and even more for some operations facilities.

## Vulnerability and Impacts to Localized Flood

Localized flooding can infiltrate the sewage collection system which can lead to the potential of overwhelming the collection system. Overwhelming the collection system can lead to uncontrolled discharges into surface waters. Impacts to the District from localized flood include possible damage to

facilities and infrastructure. Localized flooding can also affect transportation routes that District personnel must take to get to District facilities. Flood debris can cause damage to subsurface lines and appurtenances (manholes and lampholes). Localized erosion can undermine or deteriorate facilities. Pump stations may be required to perform at or above peak capacity for extended periods of time causing premature wear.

### **Assets at Risk**

Subsurface lines and appurtenances, pump stations, admin and plant operations structures.

### **Future Development**

Newer construction materials create opportunities for added robustness and should be evaluated for implementation in flood prone areas as funding permits.

### ***Severe Weather: Extreme Heat***

**Likelihood of Future Occurrence**–Highly Likely

**Vulnerability**–Medium

### **Hazard Profile and Problem Description**

Extreme heat happens in Butte County and LOAPUD each year. According to information provided by FEMA, extreme heat is defined as temperatures that hover 10 degrees or more above the average high temperature for the region and last for several weeks. Heat kills by taxing the human body beyond its abilities. According to the US Center for Disease Control, in a normal year, about 658 Americans succumb to the demands of summer heat. One of the most significant concerns with extreme heat is with vulnerable populations such as the elderly and low-income populations who might not be able to stay cool during extreme heat events. Extreme heat can also affect the operations of utilities and critical infrastructure, such as LOAPUD. In the Butte County planning area extreme heat can contribute to wildfire conditions and risk.

### **Location and Extent**

Extreme heat events occur on a countywide and regional basis. Extreme heat can occur in any location of the County and District, though it is more prevalent in the lower elevations of the County. Extreme heat occurs throughout the County and District primarily during the summer months. Heat emergencies are often slower to develop, taking several days of continuous, oppressive heat before a significant or quantifiable impact is seen. Heat waves do not strike victims immediately, but rather their cumulative effects can slowly take the lives of vulnerable populations.

### **Past Occurrences**

Since extreme heat is a regional phenomenon, heat events that occurred in the County also would have affected the District. Past heat events were shown in Section 4.2.2 of the Base Plan.

## Vulnerability and Impacts to Extreme Heat

Extreme heat happens in the Butte County Planning Area each year. Extreme heat may overload demands for electricity to run air conditioners in homes and businesses during prolonged periods of exposure and presents health concerns to individuals outside in the temperatures. Extreme heat may also be a secondary effect of droughts or may cause drought-like conditions. For example, several weeks of extreme heat increases evapotranspiration and reduces moisture content in vegetation, leading to higher wildfire vulnerability for that time period even if the rest of the season is relatively moist. Extreme heat normally does not impact structures as there may be a limited number of days where the temperatures stay high which gives the structure periodic relief between hot and cool temperature cycles.

Also of concern to LOAPUD, extreme heat can lead to brownout conditions and power shutdowns during periods of high wildfire risk such as red flag days. When power shutdowns occur during extreme heat conditions, the risk of heat related illnesses and deaths increases. For critical utilities, unless backup generators are in place, services may be strained, limited or interrupted.

Any loss of power is of special concern due to the potential for extended interruption of LOAPUD critical facilities functions which could result in uncontrolled discharges of untreated sewage if all backup systems were to fail. The District maintains nine pump stations that vary in their capacity and significance to overall District operations. Loss of power at these critical facilities triggers the requirement for 24-hour surveillance due to the type of backup systems (diesel generators) for pump station operation. Not all pump stations have backup systems. In addition to the operations aspect, pump station monitoring systems are also affected unless power backup systems are in place. The District also maintains 58 residential (single and double) pump systems (electrical pumps) for a Septic Tank Effluent Pump (STEP) system.

### Assets at Risk

The District Planning Team noted that pump stations, including communication network for pump station monitoring (SCADA), would be at risk.

### Future Development

If new facilities are constructed, local building codes shall be followed as applicable. Power backup systems currently in place for operations and communication sites should be evaluated and updated for hardening as funding permits. Special consideration shall be given to those future developments that are in areas served by lift stations due to the subsequent increase in flow to the facility which could elevate the possibility and severity of uncontrolled discharges.

## *Severe Weather: Freeze and Winter Storm*

**Likelihood of Future Occurrence**–Likely

**Vulnerability**–Medium

### **Hazard Profile and Problem Description**

According to the National Weather Service (NWS) and the Western Regional Climate Center (WRCC), extreme cold often accompanies a winter storm or is left in its wake. Winter storms in the District, while not typical, can include freezing temperatures, snow, and ice. Prolonged exposure to cold can cause frostbite or hypothermia and can be life-threatening. Infants and the elderly are most susceptible. Pipes may freeze and burst in homes or buildings that are poorly insulated or without heat. Freezing temperatures can cause significant damage to the agricultural industry.

### **Location and Extent**

Freeze and winter storms are regional issues, meaning the entire District is at risk to freeze and winter storms. While there is no scale (i.e. Richter, Enhanced Fujita) to measure the effects of freeze, temperature data for the County from the WRCC indicates that there are 21.8 days that fall below 32°F in western Butte County, with no days falling below 0°F. Freeze has a slow onset and can generally be predicted in advance for the County. Freeze events can last for hours (typically overnight), or for days to weeks at a time. Snowfall is measured in snow depths. It is rare for snow to fall, and even rarer that snow accumulates in the District. Snowfall has an onset that is similar to freeze in the District.

### **Past Occurrences**

The LOAPUD Planning Team noted that since freeze and winter storm is a regional phenomenon, events that affected the lower elevations of the County also affected the District. Those past occurrences were shown in the Base Plan in Section 4.2.3

### **Vulnerability and Impacts to Freeze and Winter Storm**

The District can experience temperatures below 32 degrees during the winter months. The temperature moves to the teens in rather extreme situations. Snow, though rare, can occur in the District. These winter conditions can cause downed trees and power lines, power outages, accidents, and road closures. District facilities can be affected by loss of electricity. Any loss of power is of special concern due to the potential for extended interruption of LOAPUD critical facilities functions which could result in uncontrolled discharges of untreated sewage if all backup systems were to fail. The District maintains nine pump stations that vary in their capacity and significance to overall District operations. Loss of power at these critical facilities triggers the requirement for 24-hour surveillance due to the type of backup systems (diesel generators) for pump station operation. In addition to the operations aspect, pump station monitoring systems are also affected unless power backup systems are in place. The District also maintains 58 residential (single and double) pump systems (electrical pumps) for a Septic Tank Effluent Pump (STEP) system.

## Assets at Risk

The District Planning Team noted that pump stations, including communication network for pump station monitoring (SCADA), would be at risk.

## Future Development

If new facilities are constructed, local building codes shall be followed as applicable. Power backup systems currently in place for operations and communication sites should be evaluated and updated for hardening as funding permits. Special consideration shall be given to those future developments that are in areas served by lift stations due to the subsequent increase in flow to the facility which could elevate the possibility and severity of uncontrolled discharges.

## *Severe Weather: Heavy Rain and Storms*

**Likelihood of Future Occurrence**–Highly Likely

**Vulnerability**–Medium

## Hazard Profile and Problem Description

Storms in the District occur annually and are generally characterized by heavy rain often accompanied by strong winds and sometimes lightning and hail. Approximately 10 percent of the thunderstorms that occur each year in the United States are classified as severe. A thunderstorm is classified as severe when it contains one or more of the following phenomena: hail that is three-quarters of an inch or greater, winds in excess of 50 knots (57.5 mph), or a tornado. Heavy precipitation in the District occurs mainly in the fall, winter, and spring months.

## Location and Extent

Heavy rain events occur on a regional basis. Rains and storms can occur in any location of the District. All portions of the District are at risk to heavy rains. Most of the severe rains occur during the winter months. There is no scale by which heavy rains and severe storms are measured. Magnitude of storms is measured often in rainfall and damages. The speed of onset of heavy rains can be short, but accurate weather prediction mechanisms often let the public know of upcoming events. Duration of severe storms in California, Butte County, and the District is often short, ranging from minutes to hours. In some cases, rains can continue for days at a time. Information on precipitation extremes can be found in Section 4.2.4 of the Base Plan.

## Past Occurrences

The District Planning Team noted the following heavy rain events.

- March 2016 Rain Event
- December 2016-February 2017 Rain Event

As shown in the Localized Flooding section of this annex, these events caused issues in and around the District.

## Vulnerability and Impacts to Heavy Rain and Storms

According to historical hazard data, severe weather is an annual occurrence in the County and the District. Damage and disaster declarations related to severe weather have occurred and will continue to occur in the future. Heavy rain and severe storms are the most frequent type of severe weather occurrences in the District. Wind and lightning often accompany these storms and have caused damage in the past. Hail is rare in the District.

Actual damage associated with the primary effects of severe storms have been limited. It is the secondary hazards caused by weather, such as floods, that have had the greatest impact on the District. Impacts to property, critical facilities, and life safety can be expected. Heavy rains and storms can cause power outages, downed trees and powerlines, and can impact roadways and travel. The risk and vulnerability associated with these secondary hazards are discussed in the flood sections of this Annex.

Any loss of power is of special concern due to the potential for extended interruption of LOAPUD critical facilities functions which could result in uncontrolled discharges of untreated sewage if all backup systems were to fail. The District maintains nine pump stations that vary in their capacity and significance to overall District operations. Loss of power at these critical facilities triggers the requirement for 24-hour surveillance due to the type of backup systems (diesel generators) for pump station operation. In addition to the operations aspect, pump station monitoring systems are also affected unless power backup systems are in place. The District also maintains 58 residential (single and double) pump systems (electrical pumps) for a Septic Tank Effluent Pump (STEP) system.

### Assets at Risk

The District Planning Team noted that pump stations, including communication network for pump station monitoring (SCADA), would be at risk.

### Future Development

If new facilities are constructed, local building codes shall be followed as applicable. Power backup systems currently in place for operations and communication sites should be evaluated and updated for hardening as funding permits. Special consideration shall be given to those future developments that are in areas served by lift stations due to the subsequent increase in flow to the facility which could elevate the possibility and severity of uncontrolled discharges.

### *Severe Weather: Wind and Tornado*

**Likelihood of Future Occurrence**–Likely

**Vulnerability**–Medium

## Hazard Profile and Problem Description

High winds can cause significant property and crop damage, threaten public safety, and have adverse economic impacts from business closures and power loss. High winds, as defined by the NWS glossary, are sustained wind speeds of 40 mph or greater lasting for 1 hour or longer, or winds of 58 mph or greater

for any duration. These winds may occur as part of a seasonal climate pattern or in relation to other severe weather events such as thunderstorms.

Tornadoes and funnel clouds can also occur during these types of severe storms. Tornadoes are another severe weather hazard that, though rare, can affect areas Valley zones in the Butte County Planning Area, primarily during the rainy season in the late fall and early spring. Tornadoes form when cool, dry air sits on top of warm, moist air. Tornadoes are rotating columns of air marked by a funnel-shaped downward extension of a cumulonimbus cloud whirling at destructive speeds of up to 300 mph, usually accompanying a thunderstorm.

### **Location and Extent**

The entire Planning Area and LOAPUD is subject to significant, non-tornadic (straight-line), winds. Each area of the District is at risk to high winds. Magnitude of winds is measured often in speed and damages. These events are often part of a heavy rain and storm event but can occur outside of storms. The speed of onset of winds can be short, but accurate weather prediction mechanisms often let the public know of upcoming events. Duration of winds in California and the Planning Area is often short, ranging from minutes to hours. The Beaufort scale is an empirical measure that relates wind speed to observed conditions at sea or on land and is shown in Section 4.2.5 of the Base Plan.

Tornadoes, while rare, can occur at any location in the County and District. The areas in the Valley in the County tend to be at greater risk than the areas in the foothills and at elevation. Prior to February 1, 2007, tornado intensity was measured by the Fujita (F) scale. This scale was revised and is now the Enhanced Fujita scale. Both scales are sets of wind estimates (not measurements) based on damage. The new scale provides more damage indicators (28) and associated degrees of damage, allowing for more detailed analysis and better correlation between damage and wind speed. It is also more precise because it considers the materials affected and the construction of structures damaged by a tornado. These scales are shown in Section 4.2.5 of the Base Plan. Speed of onset of tornadoes is short, as are their durations.

### **Past Occurrences**

In the mid 1990's a tornado caused damage in the vicinity of the Vista Del Cerro neighborhood. The District has a pump facility in this area, no damage was sustained.

### **Vulnerability and Impacts to Wind and Tornado**

The District is subject to potentially destructive straight-line winds and tornadoes. High winds are common throughout the area and can happen during most times of the entire year and outside of a severe storm event. Tornadoes are less common and tend to occur mostly in the western portion of the County. Straight line and tornadoes winds are primarily a public safety and economic concern. Windstorms and tornadoes can cause damage to structures and power lines which in turn can create hazardous conditions for people. Debris flying from high wind or tornado events can shatter windows in structures and vehicles and can harm people that are not adequately sheltered.

Any loss of power, whether caused by high winds or otherwise, is of special concern due to the potential for extended interruption of LOAPUD critical facilities functions which could result in uncontrolled

discharges of untreated sewage if all backup systems were to fail. The District maintains nine pump stations that vary in their capacity and significance to overall District operations. Loss of power at these critical facilities triggers the requirement for 24-hour surveillance due to the type of backup systems (diesel generators) for pump station operation. In addition to the operations aspect, pump station monitoring systems are also affected unless power backup systems are in place. The District also maintains 58 residential (single and double) pump systems (electrical pumps) for a Septic Tank Effluent Pump (STEP) system.

### **Assets at Risk**

The District Planning Team noted that pump stations, including communication network for pump station monitoring (SCADA), would be at risk.

### **Future Development**

If new facilities are constructed, local building codes shall be followed as applicable. Power backup systems currently in place for operations and communication sites should be evaluated and updated for hardening as funding permits. Special consideration shall be given to those future developments that are in areas served by lift stations due to the subsequent increase in flow to the facility which could elevate the possibility and severity of uncontrolled discharges.

### ***Wildfire***

**Likelihood of Future Occurrence**–Highly Likely  
**Vulnerability**–Medium

### **Hazard Profile and Problem Description**

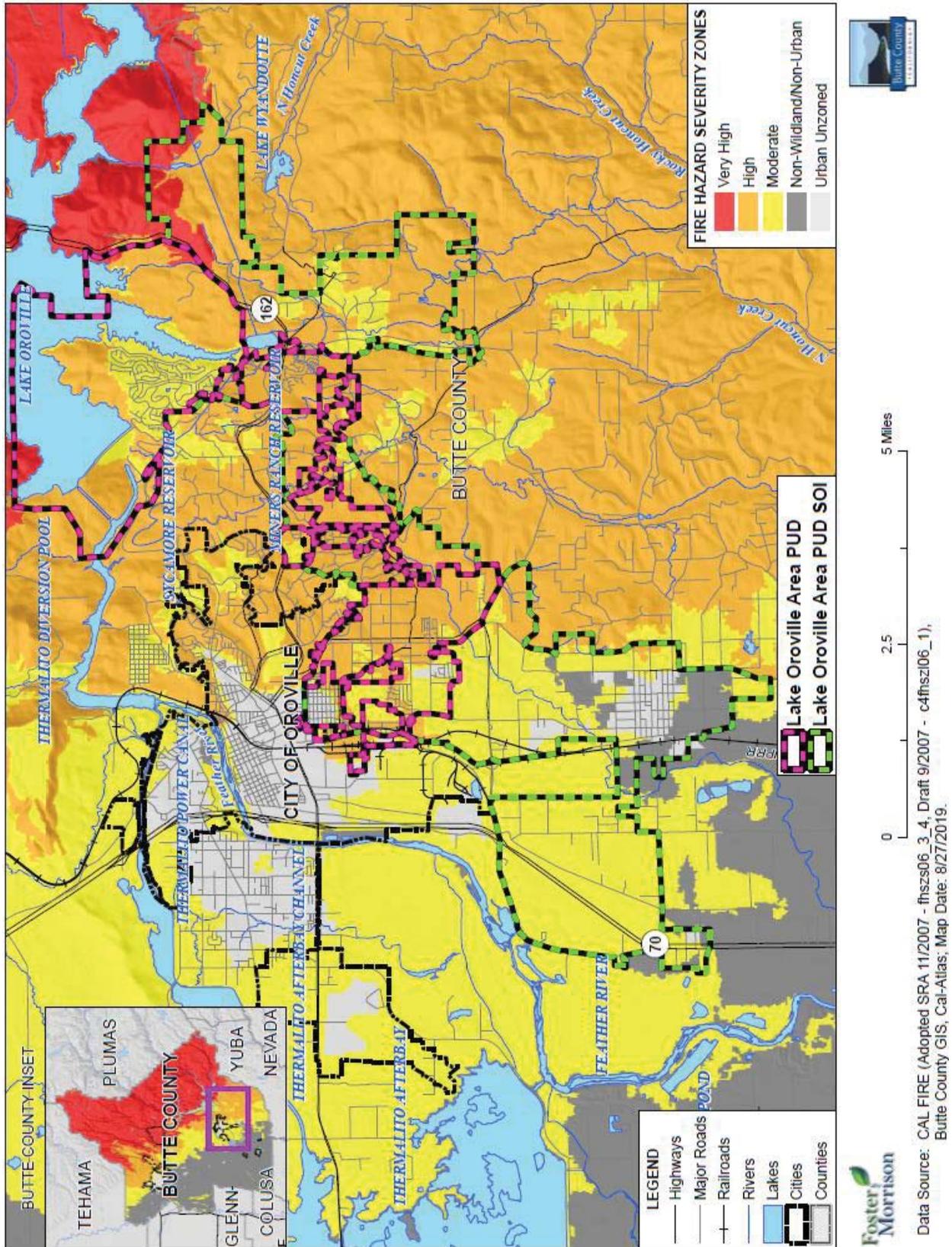
Wildland fire is an ongoing concern for the District. Generally, the fire season extends from early spring through late fall of each year during the hotter, dryer months. Fire conditions arise from a combination of high temperatures, low moisture content in the air and fuel, accumulation of vegetation, and high winds. Throughout California, communities are increasingly concerned about wildfire safety as increased development in the foothills and mountain areas and subsequent fire suppression practices have affected the natural cycle of the ecosystem. While the fire season was considered to be predominantly May through October, it has now become a year-round concern. Complicating the issue, PG&E shutdowns can occur during red flag days, which affects the District.

In some instances, access to critical facilities must be maintained in order to properly maintain and monitor them. Any loss of power is of special concern due to the potential for extended interruption of LOAPUD critical facilities functions which could result in uncontrolled discharges of untreated sewage if all backup systems were to fail. The District maintains nine pump stations that vary in their capacity and significance to overall District operations. Loss of power at these critical facilities triggers the requirement for 24-hour surveillance due to the type of backup systems (diesel generators) for pump station operation. Not all pump stations have backup systems. In addition to the operations aspect, pump station monitoring systems are also affected unless power backup systems are in place. The District also maintains 58 residential (single and double) pump systems (electrical pumps) for a Septic Tank Effluent Pump (STEP) system.

## Location and Extent

CAL FIRE has mapped wildfire risk areas in Fire Hazard Severity Zones (FHSZ). The District lies in Moderate to Very High Fire Hazard Severity Zone. Approximate District locations and FHSZ are shown on Figure L-3.

Figure L-3 Lake Oroville Area Public Utility District – FHSZs



Wildfires tend to be measured in structure damages, injuries, and loss of life as well as on acres burned. Fires can have a quick speed of onset, especially during periods of drought. Fires can burn for a short period of time or may have durations lasting for a week or more.

### **Past Occurrences**

The District Planning Team noted the following events:

- Camp Fire- Effects from evacuations and smoke
- Wall Fire-Effects from evacuations and smoke
- 2008 fires in Cherokee and Bangor-Effects from smoke

### **Vulnerability and Impacts to Wildfire**

Risk and vulnerability to the Butte County Planning Area and the District from wildfire is of significant concern, with some areas of the Planning Area being at greater risk than others. High fuel loads in the Planning Area, along with geographical and topographical features, create the potential for both natural and human-caused fires that can result in loss of life and property. These factors, combined with natural weather conditions common to the area, including periods of drought, high temperatures, low relative humidity, and periodic winds, can result in frequent and sometimes catastrophic fires. During the May to November fire season, the dry vegetation and hot and sometimes windy weather, combined with continued growth in the Wildland Urban Interface (WUI) areas, results in an increase in the number of ignitions. Any fire, once ignited, has the potential to quickly become a large, out-of-control fire. As development continues throughout the Planning Area, especially in these interface areas, the risk and vulnerability to wildfires will likely increase.

The District is not immune to numerous types of grass and brush fires and any one of them may accelerate into a large urban interface wildfire. Such a situation could lead to evacuation of large portions of the population and the potential for significant loss of personal property, structures and rangeland. The natural fuels available in or near the District vary in the rate and intensity of burning

Wildfires can cause short-term and long-term disruption to the County and District, as evidenced by the Camp Fire in Paradise and the resultant increase in the population in Oroville. Fires can have devastating effects on watersheds through loss of vegetation and soil erosion, which may impact the County by changing runoff patterns, increasing sedimentation, reducing natural and reservoir water storage capacity, and degrading water quality. Fires may result in casualties and can destroy buildings and infrastructure.

Although the physical damages and casualties arising from wildland-urban interface fires may be severe, it is important to recognize that they also cause significant economic impacts by resulting in a loss of function of buildings and infrastructure. In some cases, the economic impact of this loss of services may be comparable to the economic impact of physical damages or, in some cases, even greater. Economic impacts of loss of transportation and utility services may include traffic delays/detours from road and bridge closures and loss of electric power, potable water, and wastewater services. Fires can also cause major damage to power plants and power lines needed to distribute electricity to operate facilities.

Complicating the issue, PG&E shutdowns can occur during red flag days, which affects the District. Any loss of power is of special concern due to the potential for extended interruption of LOAPUD critical facilities functions which could result in uncontrolled discharges of untreated sewage if all backup systems were to fail. The District maintains nine pump stations that vary in their capacity and significance to overall District operations. Loss of power at these critical facilities triggers the requirement for 24-hour surveillance due to the type of backup systems (diesel generators) for pump station operation. Not all pump stations have backup systems. In addition to the operations aspect, pump station monitoring systems are also affected unless power backup systems are in place. The District also maintains 58 residential (single and double) pump systems (electrical pumps) for a Septic Tank Effluent Pump (STEP) system.

### Assets at Risk

The District planning team noted that pump stations, including communication network for pump station monitoring (SCADA), would be at risk.

### Future Development

If new facilities are constructed, local building codes shall be followed as applicable. Power backup systems currently in place for operations and communication sites should be evaluated and updated for hardening as funding permits. Special consideration shall be given to those future developments that are in areas served by lift stations due to the subsequent increase in flow to the facility which could elevate the possibility and severity of uncontrolled discharges.

## L.6 Capability Assessment

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

### L.6.1. Regulatory Mitigation Capabilities

Table L-5 lists regulatory mitigation capabilities, including planning and land management tools, typically used by local jurisdictions to implement hazard mitigation activities and indicates those that are in place in the District.

*Table L-5 Lake Oroville Area Public Utility District – Regulatory Mitigation Capabilities*

Plans	Y/N Year	Does the plan/program address hazards? Does the plan identify projects to include in the mitigation strategy? Can the plan be used to implement mitigation actions?
General Plan	Unknown	Under others jurisdiction
Capital Improvements Plan	Y	For District operations
Economic Development Plan	Unknown	Under others jurisdiction

Local Emergency Operations Plan	Unknown	Under others jurisdiction
Continuity of Operations Plan	Unknown	Under others jurisdiction
Transportation Plan	Unknown	Under others jurisdiction
Stormwater Management Plan/Program	Unknown	Under others jurisdiction
Engineering Studies for Streams	Unknown	Under others jurisdiction
Community Wildfire Protection Plan	Unknown	Under others jurisdiction
Other special plans (e.g., brownfields redevelopment, disaster recovery, coastal zone management, climate change adaptation)	Y-Needs Update in 2019	Sewer System Management Plan
Other special plans (e.g., brownfields redevelopment, disaster recovery, coastal zone management, climate change adaptation)	Y-Needs Update in 2021	Emergency Response Plan
Other special plans (e.g., brownfields redevelopment, disaster recovery, coastal zone management, climate change adaptation)	Y-Needs Update in 2019-2020	Sewer System Master Plan
<b>Building Code, Permitting, and Inspections</b>	<b>Y/N</b>	<b>Are codes adequately enforced?</b>
Building Code	Y	Field staff works with local code enforcement. District has adopted a set of standards for facility construction
Building Code Effectiveness Grading Schedule (BCEGS) Score	Unknown	Under others jurisdiction
Fire department ISO rating:	Unknown	Under others jurisdiction
Site plan review requirements	Y	Site plan is typically required for permit application
<b>Land Use Planning and Ordinances</b>	<b>Y/N</b>	<b>Is the ordinance an effective measure for reducing hazard impacts? Is the ordinance adequately administered and enforced?</b>
Zoning ordinance	Unknown	Under others jurisdiction
Subdivision ordinance	Unknown	Under others jurisdiction
Floodplain ordinance	Unknown	Under others jurisdiction
Natural hazard specific ordinance (stormwater, steep slope, wildfire)	Unknown	Under others jurisdiction
Flood insurance rate maps	Unknown	Under others jurisdiction
Elevation Certificates	Unknown	Under others jurisdiction
Acquisition of land for open space and public recreation uses	Unknown	Under others jurisdiction
Erosion or sediment control program	Unknown	Under others jurisdiction
Other		District maintains Rules, Regulations, and Improvement Standards for development of sewer collection system within District.

**How can these capabilities be expanded and improved to reduce risk?**

Staffing and funding keep these capabilities from being expanded. While unlikely to occur, additional funding and staffing could expand the mitigation capability of the District.

Source: LOAPUD

**L.6.2. Administrative/Technical Mitigation Capabilities**

Table L-6 identifies the District staff/roles responsible for activities related to mitigation and loss prevention in the District.

*Table L-6 Lake Oroville Area Public Utility District – Administrative and Technical Mitigation Capabilities*

Administration	Y/N	Describe capability Is coordination effective?
Planning Commission	Y	Development of District facilities is an inherent part of planning commission and LAFCO processes.
Mitigation Planning Committee	Y	See above
Maintenance programs to reduce risk (e.g., tree trimming, clearing drainage systems)	Y	Continuous monitoring for repairs and scheduled cleaning of collection system is performed.
Mutual aid agreements	N	Informal-some sharing of resources is performed among similar districts-mainly of specific equipment and intellectual resources.
Other		
Staff	Y/N FT/PT	Is staffing adequate to enforce regulations? Is staff trained on hazards and mitigation? Is coordination between agencies and staff effective?
Chief Building Official	N/A	
Floodplain Administrator	N/A	
Emergency Manager	N/A	
Community Planner	N/A	
Civil Engineer	Y	District uses a consultant for engineering services
GIS Coordinator	Y	District uses a consultant for GIS services
Other		District is small-only 3 full-time office staff and 5 full-time field staff
Technical		
Warning systems/services (Reverse 911, outdoor warning signals)	Y	District maintains a 24 hr answering service and rotating field staff.
Hazard data and information	N	
Grant writing	N	
Hazus analysis	N	
Other		

**How can these capabilities be expanded and improved to reduce risk?**

Integration of GIS resources between all agencies could dramatically improve information flow

Source: LOAPUD

### L.6.3. Fiscal Mitigation Capabilities

Table L-7 identifies financial tools or resources that the District could potentially use to help fund mitigation activities.

*Table L-7 Lake Oroville Area Public Utility District – Fiscal Mitigation Capabilities*

Funding Resource	Access/ Eligibility (Y/N)	Has the funding resource been used in past and for what type of activities? Could the resource be used to fund future mitigation actions?
Capital improvements project funding	Y	Yes.
Authority to levy taxes for specific purposes	Y	Yes. Restricted to service provided (i.e. system specific)
Fees for water, sewer, gas, or electric services	Y/N	Fees collected are for O&M of system and expansion. Some funds are restricted to their usage. Funds could be potentially available for mitigation if it benefited District operations and customers as outlined in District Master Plan
Impact fees for new development	Y/N	Capacity fees are restricted to system expansion
Storm water utility fee	N	
Incur debt through general obligation bonds and/or special tax bonds	Y	District is currently paying down a USDA bond that was used for system upgrades and expansion
Incur debt through private activities	Y	District may seek funding through conventional loan arrangements. Board action required.
Community Development Block Grant	Y	Through partnerships
Other federal funding programs	Y/N	Grants have been applied for -in general applications have been for system specific needs.
State funding programs		See above
Other		
<b>How can these capabilities be expanded and improved to reduce risk?</b>		
Provide appropriate grant funding that is accessible for special districts		

Source: LOAPUD

### L.6.4. Mitigation Education, Outreach, and Partnerships

Table L-8 identifies education and outreach programs and methods already in place that could be/or are used to implement mitigation activities and communicate hazard-related information. More information can be found below the table.

**Table L-8 Lake Oroville Area Public Utility District – Mitigation Education, Outreach, and Partnerships**

Program/Organization	Yes/No	Describe program/organization and how relates to disaster resilience and mitigation. Could the program/organization help implement future mitigation activities?
Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	N	
Ongoing public education or information program (e.g., responsible water use, fire safety, household preparedness, environmental education)	Y	Information regarding Fats, Oils, and Grease for proper care of a sanitary sewer system is included in the District Rules and Regulations
Natural disaster or safety related school programs	N	
StormReady certification	N	
Firewise Communities certification	N	
Public-private partnership initiatives addressing disaster-related issues	N	
Other		
<b>How can these capabilities be expanded and improved to reduce risk?</b>		
Distribution of partner agency materials through available customer interface.		

Source: LOAPUD

**L.6.5. Other Mitigation Efforts**

LOAPUD has many other ongoing mitigation efforts and past projects that include the following:

- In general, as an enterprise district LOAPUD is responsible for maintaining its system so that it can best serve its constituents.
- As part of the required work for O&M, the District monitors the environment for adverse situations.
- LOAPUD maintain safety programs and hold staff meetings to ensure communication of requirements and to keep information current.
- Maintenance of system includes:
  - Mapping (GIS-ongoing)
  - Maintenance of lines and facilities
  - Clearing of brush, etc.-For access to facilities and fire safety

**L.7 Mitigation Strategy**

**L.7.1. Mitigation Goals and Objectives**

Lake Oroville Area Public Utility District adopts the hazard mitigation goals and objectives developed by the HMPC and described in Chapter 5 Mitigation Strategy.

## L.7.2. Mitigation Actions

The planning team for LOAPUD identified and prioritized the following mitigation actions based on the risk assessment. Background information and information on how each action will be implemented and administered, such as ideas for implementation, responsible office, potential funding, estimated cost, and timeline are also included. The following hazards were considered a priority for purposes of mitigation action planning:

- Flood: 100-/500-year
- Floods: Localized Stormwater
- Severe Weather: Extreme Heat
- Severe Weather: Freeze and Winter Storm
- Severe Weather: Heavy Rain and Storms
- Severe Weather: Wind and Tornado
- Wildfire

It should be noted that many of the projects submitted by each jurisdiction in Table 5-4 in the Base Plan benefit all jurisdictions whether or not they are the lead agency. Further, many of these mitigation efforts are collaborative efforts among multiple local, state, and federal agencies. In addition, the countywide public outreach action, as well as many of the emergency services actions, apply to all hazards regardless of hazard priority. Collectively, this multi-jurisdictional mitigation strategy includes only those actions and projects which reflect the actual priorities and capacity of each jurisdiction to implement over the next 5-years covered by this plan.

### *Mitigation Actions*

#### *Action 1. Lake Oroville Area Public Utility District Stress Testing*

---

**Hazards Addressed:** Flooding and Localized Flooding, Earthquake, Wildfire, Dam Failure, Severe Weather, Power Outages

**Goals Addressed:** 2

**Issue/Background** The primary function of LOAPUD is to collect and convey untreated sewage to the treatment plant. The majority of critical District facilities have backup systems in place to insure the continued function of the critical facility (e.g.-pump station with backup generators). However, any unprecedented hazardous event could overwhelm District facilities given a particular set of circumstances. Stress testing the District facilities could illuminate and prioritize some of these problem areas that might remain undetected.

**Project Description:** Perform formalized stress testing for District critical facilities identifying and prioritizing projects for phased implementation (TBD) as part of an approved improvement program. Project would involve:

1. Stress Test District
2. Evaluate outcomes

3. Make recommendations
4. Implement solutions (as funding permits)

**Other Alternatives:** Conduct informal stress testing and evaluate and implement solutions as necessity dictates and funding permits.

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

**Responsible Office/Partners:** LOAPUD

**Cost Estimate:** TBD

**Benefits (Losses Avoided):**

- LOSSES AVOIDED: Uncontrolled discharge of untreated sewage
- BENEFITS: Updated District facilities

**Potential Funding:** Grants

**Timeline:** Within 3 budget cycles.

**Project Priority:** High

**Project Priority:** High

## ***Action 2. Lake Oroville Area Public Utility District Backup Generators***

---

**Hazards Addressed:** Flooding and Localized Flooding, Earthquake, Wildfire, Dam Failure, Severe Weather, Power Outages

**Goals Addressed:** 2

**Issue/Background:** Backup generation is the main way in which the District maintains continued function of its critical facilities. Currently the District has only one portable generator that can be used in case of power outage. It is housed at the District office. In the instance of a widespread and prolonged power outage there is a risk that additional power generation would be needed at facilities that do not have backup generation. Additional generators would mitigate some of the risk of a prolonged outage.

**Project Description:** Purchase additional portable backup generators.

**Other Alternatives:** Install permanent backup generation at the District main office and other critical facilities without permanent backup power generation.

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

**Responsible Office/Partners:** LOAPUD

**Cost Estimate:** TBD

**Benefits (Losses Avoided):**

- LOSSES AVOIDED: Uncontrolled discharge of untreated sewage
- BENEFITS: Updated District facilities

**Potential Funding:** Grants

**Timeline:** Within 3 budget cycles.

**Project Priority:** High

***Action 3. Lake Oroville Area Public Utility District Overflow Capacity at Lift Stations***

---

**Hazards Addressed:** Flooding, Wildfire, Dam Failure, Severe Weather, Power Outages

**Goals Addressed:** 2

**Issue/Background:** Interruption in power supply can create the need for backup systems to be put in action. Backup-generators and pumps are excellent ways to keep facilities running, however, refueling can become problematic depending on access and availability of fuel if outages are prolonged. A low-tech option for system redundancy is the installation of overflow tanks which increase the resiliency of the lift station. While some of LOAPUD's lift stations have overflow storage, 5 out of 9 do not.

**Project Description:** Install overflow storage at existing lift stations that do not currently have this type of system in place.

**Other Alternatives:** Evaluate which critical lift stations would benefit the most from this type of system and install backup storage at these locations if not already in place.

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

**Responsible Office/Partners:** LOAPUD

**Cost Estimate:** TBD

**Benefits (Losses Avoided):**

- LOSSES AVOIDED: Uncontrolled discharge of untreated sewage
- BENEFITS: Updated District facilities

**Potential Funding:** Grants

**Timeline:** Within 5 budget cycles.

**Project Priority:** High

**Action 4. Lake Oroville Area Public Utility District Emergency Fueling**

---

**Hazards Addressed:** Flooding, Wildfire, Dam Failure, Severe Weather, Power Outages

**Goals Addressed:** 2

**Issue/Background:** The primary backup systems found at the majority of District facilities consist of diesel-powered generators with varying fuel tank capacities. A prolonged period of power outage creates the need for consistent refueling. The refueling effort is currently accomplished by use of a small capacity fuel cell that is conveyed to the lift stations by field staff. Filling of the fuel cell at the District's main fueling station can also be affected by power outage, compounding difficulties in situations that require emergency refueling.

**Project Description:** Review the District's current refueling capabilities and create redundancy to enable consistent fuel delivery during a crisis. This could include:

1. Assessing the District's fuel supply chain (outside sources)
2. Evaluate the District's ability to dispense fuel in power outages
3. Analyze District capacity to deliver and dispense fuel based on worst-case scenarios
4. Purchase equipment and/or upgrade existing systems to mitigate any issues discovered in the review.

**Other Alternatives:** No action

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

**Responsible Office/Partners:** LOAPUD

**Cost Estimate:** TBD

**Benefits (Losses Avoided):**

- LOSSES AVOIDED: Uncontrolled discharge of untreated sewage
- BENEFITS: Updated District facilities

**Potential Funding:** Grants

**Timeline:** Within 2 budget cycles.

**Project Priority:** High

**Action 5. Lake Oroville Area Public Utility District Mooretown Lift Station Flood Impact Analysis**

---

**Hazards Addressed:** Flooding

**Goals Addressed:** 2

**Issue/Background:** The Mooretown Lift Station is located at the fringe of a 100-year Zone A floodplain according to Base Plan maps. Any effects of a 100-year event on the lift station have not been determined.

**Project Description:** Review the location of the Mooretown Lift Station in relation to current established flood risk and determine a best course of action for mitigation if needed.

**Other Alternatives:** No action

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

**Responsible Office/Partners:** LOAPUD

**Cost Estimate:** TBD

**Benefits (Losses Avoided):**

- LOSSES AVOIDED: Uncontrolled discharge of untreated sewage
- BENEFITS: Updated District facilities

**Potential Funding:** Grants

**Timeline:** Within 2 budget cycles.

**Project Priority:** High

#### ***Action 6. Lake Oroville Area Public Utility District Portable Backup Generators***

---

**Hazards Addressed:** Flooding, Wildfire, Dam Failure, Severe Weather, Power Outages

**Goals Addressed:** 2

**Issue/Background:** Backup generation is the main way in which the District maintains continued function of its critical facilities. Currently the District has only one portable generator that can be used in case of power outage. It is housed at the District office. In the instance of a widespread and prolonged power outage there is a risk that additional power generation would be needed at facilities that do not have backup generation. Additional generators would mitigate some of the risk of a prolonged outage.

**Project Description:** Purchase additional portable backup generators.

**Other Alternatives:** Install permanent backup generation at the District main office and other critical facilities without permanent backup power generation.

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

**Responsible Office/Partners:** LOAPUD

**Cost Estimate:** TBD

**Benefits (Losses Avoided):**

- Losses Avoided: Uncontrolled discharge of untreated sewage
- Benefits: Updated District facilities

**Potential Funding:** Grants

**Timeline:** Within 3 budget cycles.

**Project Priority:** High